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Reorganization of the Command and General Staff College

Lieutenant Colonel E. A. Salet, *Infantry*
Instructor, Command and General Staff College

"Nothing in progress can rest on its original plan. We may as well think of rocking a grown man in the cradle of an infant"—Edmund Burke.

ON 1 May 1948, Lieutenant General Manton S. Eddy, director of the Army Educational System, and Commandant of the Command and General Staff College, announced the reorganization of the latter in the interest of greater efficiency and more effective instruction.

Organized in 1881 as an Infantry and Cavalry School, the Command and General Staff College has increased in importance in the Army's officer educational system, until today it is the highest level military college operated solely by the Army. The position of pre-eminence now enjoyed by the college in the educational field, did not, like Topsy, just grow, but is the result of a studious and concentrated effort exerted by many individuals through the years for continued improvement and ultimate perfection in accomplishing its assigned mission.

Initial Impetus for Reorganization

Lepidus: "But small to great matters must give way."

Enobarbus: "Not if the small come first."

To gain a more thorough understanding of the developments which led to

the present reorganization of the college, it is apropos at this time to delve into the recent history of the college.

Although the college was first organized many years ago, what is essentially a new college was created in the fall of 1946. Within a comparatively short period the administration and faculty had to prepare a new curriculum, plan the instruction, and get the new program under way. A new curriculum had to be developed based on the conduct and lessons of World War II. It meant painstaking research into new sources. It meant the organization of new schools, such as personnel, and building up the content of courses for these schools, so that the mission of the college could be effectively accomplished.

As a matter of economy of time and effort, if for no other reason, it was planned to have the instructors specialize in their preparation and instruction and to teach the class as a single group. The emphasis during the first year of the new college, of necessity, had to be on the preparation of the curriculum. It would have meant a super-human task to have the faculty at the same time give the instructional planning the emphasis it merited.

Smaller classes and the new Department of the Commander and General Staff are among the features of the reorganization of the C&GSC, but the content and character of instruction will remain unchanged

Nevertheless, Lieutenant General L. T. Gerow, then Commandant of the College, took positive steps toward eventually reorganizing the college, the reorganization to be based upon a more functional curriculum.

On 4 June 1946, General Gerow recommended to the ACoS G-3, War Department General Staff, that "The Adjutant General be directed to order a team from the Personnel Research Section of his office to temporary duty at Ft. Leavenworth, Kansas, at the earliest practicable date, to advise and assist the faculty in the planning, conduct and administration of instruction."

Pursuant to the request of General Gerow, a commission consisting of four widely known civilian educators was appointed in the fall of 1946 to make a survey of the college. The commission in turn interpreted its mission to be a survey of the program of the college in relation to the objective of officer education, and to deal with the other objectives only insofar as they contribute to the professional education of officers. The purpose of the survey was to make an evaluation of the various aspects of the educational program as a basis for rendering assistance in improving it.

To quote from the report rendered by the commission, "It was apparent to the commission from the start that the college is permeated by an exceedingly high level of professional interest and spirit of cooperation. The staff of the college was faced with tasks of major proportion in developing an essentially new program under a new organization, in a limited space of time. Although many of the members of the staff have had some professional preparation in education and psychology, they can hardly be expected to qualify as experts in higher education. It is therefore gratifying that the quality of the program, as it has been planned for this year, is at as high a level as

would be expected of a staff of professionally trained experts in the fields of psychology and education."

The commission, in its Summary of the Findings, pointed out that the interpretation of the officer education objective has been strongly influenced by the *organization of the college*. It indicated that, educationally, the proper approach would be to specify in detail the interpretation of the mission, and then *organize the college around the curriculum*.

The mission of the Command and General Staff College, as set forth in War Department Circular No. 202, 9 July 1946, insofar as it refers to officer education, is given in the following statement of the objective of the course to be pursued at the college:

"(1) To prepare officers for duty as commanders and staff officers at the division and higher levels."

The commission interpreted the above quoted objective as follows:

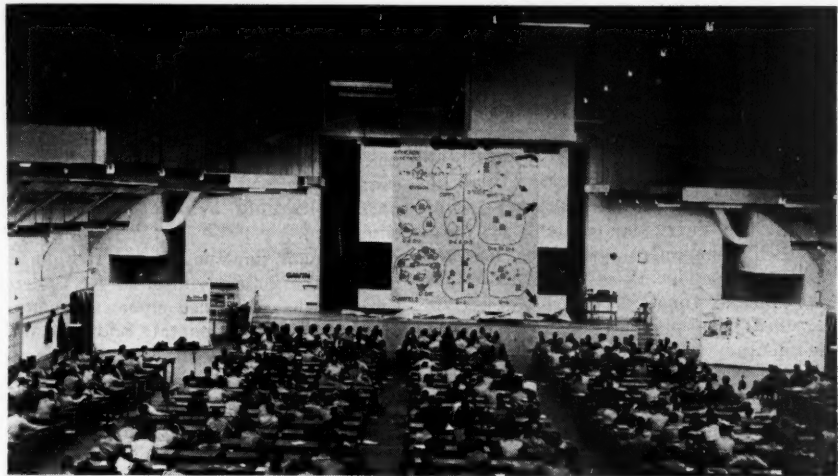
"1. To prepare officers as commanders of division, corps, and army, and at comparable level in the communications zone.

"2. To prepare officers for any general staff assignment at division, corps, and army level.

"3. To prepare officers for key general staff assignment in one specialized area (that is in personnel, intelligence, combined arms, or logistics) at levels higher than army."

In view of this interpretation of the mission of the college, and other factors not considered in this résumé, the commission recommended in part that:

"1. The college should be reorganized as two distinct institutions (1) a college, consisting of five departments, to accomplish that part of the officer education objective of the mission that relates to training of officers for command and general staff assignments at division, corps, and army level, and compa-



Large class sessions such as this one in Gruber Hall, above, will be largely replaced by small group instruction under the recently approved reorganization of the Command and General Staff College. Below, outdoor graduation exercises for the 1947-1948 class, 2 July 1948.



rable communications zone levels, and (2) a university, consisting of four schools, to accomplish that part of the objective that relates to training for key general staff assignment above army level. The curriculum for the former purpose should be planned and developed from the point of view of command function and of general staff as it contributes to command. The curricular content provided by each department should be selected from the standpoint of its contribution to command function, and it should be provided in a manner that makes such contribution functional to the maximum possible degree. The curriculum for the latter purpose should be developed from the point of view of specialization of general staff function as it contributes to command operation above army level.

"2. The planning of the curriculum for the common course should be based on a job analysis of command functioning and of the personnel, intelligence, operations, and logistics procedures that are essential to make such command functioning effective. The curriculum in its final form should be completely functional in nature in order to permit a maximum of functional learning.

"3. It is recommended that far less time be devoted in class to passive learning. Much of the content that is now taught through the medium of what is essentially a lecture technique can undoubtedly be presented in printed form for the student to master in appreciably less time than is now devoted to it. It is further recommended that the time thus saved be used for discussion groups of more normal class size, e.g., *about 25 to 35 students*, and for more activities that involve *applicatory and experimental learning*."

Thus it can be noted that the survey commission emphasized the need for:

1. Reorganization of the college along functional and not structural lines, e.g.,

the college organization to be fitted around the curriculum; the curriculum to be developed as an operational expression of the interpretation of the officer education objective, or mission of the college.

2. Smaller classes whereby applicatory and experimental learning will be encouraged as will reflective thinking; and passive learning by the student officer eliminated.

Additional impetus toward reorganization of the college, initiated by General Gerow, was furnished upon assumption of command by General Eddy. Shortly after his arrival on the college scene in January 1948, General Eddy also expressed dissatisfaction with the present system of a single class composed of approximately 500 student officers. Coincident with the arrival of General Eddy, a letter to the Assistant Commandant from Dr. J. S. Orleans, Psycho-Educational advisor to the commandant, and a member of the original survey commission, urging a reorganization of the college into small groups, added considerable fuel to the reorganization fire.

On 8 March 1948, General Eddy directed the Acting Assistant Commandant, Colonel Don C. Faith, to appoint a Board of Officers (commonly termed the Wood Board) to consider and make recommendations on the size of classes and the organization of the faculty for the presentation of instruction during the academic year 1948-1949. Detail for the Board as prescribed by the Acting Assistant Commandant was as follows:

Colonel Stuart Wood, *Field Artillery*, President.

Lieutenant Colonel D. M. Perkins, *Field Artillery*, Member.

Lieutenant Colonel E. A. Salet, *Infantry*, Member.

Lieutenant Colonel D. C. Russell, *Infantry*, Recorder.

Dr. Orleans was directed to act as consultant to the Board.

Results of the Wood Board Deliberations

"A centipede was happy quite until the toad in fun said, 'Pray, which leg goes after which when you begin to run?' This wrought his mind in such a pitch he lay distracted in a ditch, uncertain how to run."

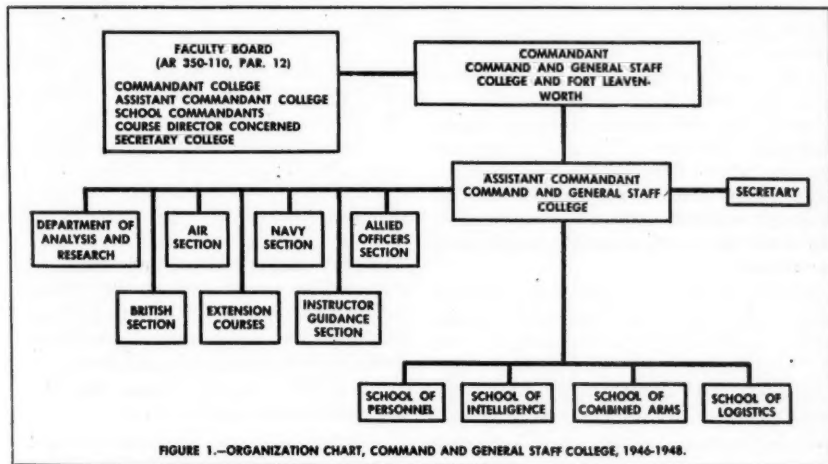
The Board met in continuous session from 8 March 1948, until completion of its task on 18 March 1948. The deliberations of the Board were based on several considerations, the more pertinent of which are quoted from the report as follows:

"1. The present large group organiza-

the fact that it creates a strictly impersonal relationship between faculty and students.

"2. The present organization of the faculty of the Command and General Staff College does not lend itself readily to carrying out the primary mission of the college for the following reasons:

a. The present organization is structural in nature and suited primarily to carrying out the second, and less important, objective of the college, namely, the specialization in respective general staff sections at Theater, Zone of the



tion of the Regular Class for instructional purposes does not lend itself to the satisfactory accomplishment of the mission of the college for the following reasons:

a. It prevents that degree of student activity and participation fundamental to satisfactory learning.

b. It prevents the control and directing of student learning that are essential to satisfactory achievement and progress.

c. It fails to exploit motivational possibilities which exist in students at the beginning of the class by virtue of

Interior and Department of the Army levels.

b. The structural organization does not readily permit the high degree of integration of instruction required to accomplish the primary mission of the college; namely, the preparation of officers for duty as commanders and general staff officers of division, corps, and army, and comparable levels in the communication zone."

As a result of its deliberations, consultations and interviews, the board concluded in part that the reorganization

of the faculty is necessary to satisfy both administrative and functional requirements of small class organization; and that the organization of the Regular Class into small groups should go far toward enabling the instructional program to fulfill the mission of the college.

In an attempt to arrive at a sound plan for reorganization of the college, the Wood Board considered a number of proposals. It adopted as a basis for planning, the outline plan submitted by Colonel R. N. Young, then Commandant of the School of Combined Arms. As a result of an exhaustive survey, the Board concluded that under this plan, with slight modifications, there were sufficient instructor time and instructional facilities available for the conduct of the Regular Course, Associate Course, National Guard, Refresher Course, Civilian Orientation Course, Allied Officers' Course, Instructor Training Course, preparation and revision of manuals and extension courses, and other activities presently assigned to the college.

As pointed out in several of the Board's many recommendations, the new organization would include the following:

1. The instructional program of common instruction for the 1948-49 Regular Class be based on twelve groups of approximately forty students each with the following exceptions:

- a. The class will meet as one body for lectures, films, demonstrations, orientation, and such other presentations as are designated by the Assistant Commandant.

- b. Map Maneuver groups.

- c. Review groups.

- d. Other instructional methods as authorized by the Assistant Commandant.

2. Twelve classrooms be made available for the Regular Course and four classrooms for the Associate Course.

3. The faculty be organized as follows:

- a. A School of Common Instruction,

headed by a Commandant, who shall be responsible to the Assistant Commandant for carrying out the primary objective of the officer-education mission of the college; namely, to prepare officers for duty as commanders and general staff officers of divisions, corps, armies, and comparable levels in the communications zone.

- b. A Faculty of the School of Common Instruction consisting of:

- (1) A Commandant.

- (2) A chief for each of five Instructional Groups, selected for his competence in at least one of the following: Personnel; intelligence; operations and training; logistics; duties, responsibilities and functions of the commander and chief of staff.

- (3) Sixty-five instructors organized into five instructional groups. At his discretion, the Commandant, School of Common Instruction, may select instructors to serve as his staff officers, e.g., Assistant Commandant and School Director. The assignment of the sixty-five instructors to the five instructional groups will provide within each instructional group a cross section of competence in:

- (a) The various arms and services, insofar as feasible.

- (b) Areas of personnel; intelligence; operations and training; logistics; and duties, responsibilities, and functions of the commander and chief of staff.

- c. Four School Commandants responsible to the Assistant Commandant for carrying out the second objective of the officer-education mission; namely, to prepare officers for duty in the specific general staff section in which they are specialized, at Theater, Zone of Interior, and Department of the Army levels.

4. a. The Commandant, School of Common Instruction, be held responsible for:

- (1) All common instruction in all

courses except as indicated by the Assistant Commandant.

(2) Seeing that map exercises and other appropriate material prepared for common instruction be designed, insofar as feasible, to reflect the activities of the general staff coordinated and integrated by the Chief of Staff.

(3) Preparation and revision of extension courses.

(4) Such other activities as the Assistant Commandant may direct.

b. The Commandants of the Schools of Personnel, Intelligence, Combined Arms, and Logistics be held responsible for:

(1) Specialized instruction in each of these schools.

(2) Preparation and revision of manuals.

(3) Such other activities as the Assistant Commandant may direct.

5. Preparation and integration of common instruction be accomplished in the following manner:

a. The Curriculum Board will prepare an outline for each instructional unit, specifying its purpose and scope; and will then transmit these outlines to the Commandant, School of Common Instruction.

b. The Commandant, School of Common Instruction, will assign these outlines to his five Instructional Groups for the preparation of the detailed directive for each instructional unit. This assignment will be made in accord with the principle that the distribution of types of instructional units to the five Instructional Groups be approximately uniform insofar as practicable, so that no one group will tend to specialize in instruction at a particular level or in a particular area.

c. The Chief of an Instructional Group will assign each outline to personnel of his group who will prepare the detailed directive. Directives will be

couched in terms of what it is desired the *student learn*, rather than what is to be taught.

d. The directive will be reviewed by the Curriculum Board and returned either approved as submitted, or as corrected by the Curriculum Board. At this time much of the controversial matter, which leads to extensive revisions under the present review procedure, will be settled when the directive is reviewed.

e. The personnel who prepare the detailed directive for an instructional unit will prepare the instruction working as an integrated staff. This procedure will conserve time and should achieve that integration of instruction which the mission of the college demands.

Subsequent Action on the Wood Board Report

"I claim not to have controlled events, but confess plainly the events have controlled me."—Abraham Lincoln.

Several days after submission of the Wood Board Report on 18 March 1948, General Eddy called a meeting of the four school commandants, and their principal assistants, for the purpose of discussing the Wood Board Report.

As a result of this and subsequent discussions, the Wood Board Report was approved by General Eddy with the following modifications:

1. The new school to be known as School of the Commander and General Staff.

2. The School of Combined Arms to be known as the School of Operations and Training.

3. The Commandants, School of Personnel, School of Intelligence, School of Operations and Training, and School of Logistics to act as advisors and consultants within their respective fields to the Commandant, School of the Commander and General Staff, and to all instructors within that school. As members of the Curriculum Board, they will ensure sound planning for the integration

of their respective fields within the program of common instruction.

4. Beginning with the school year 1948-1949, the present school commandants to be called school directors, i.e., Director, School of Personnel, etc.

5. In Phase V (the specialized phase), the school commandants concerned will determine whether the school will sit as a single unit or be broken into smaller units.

6. The actual preparation and revision of extension courses and of manuals will be accomplished by the five schools in accord with the nature of the subject content.

7. The Commandant, School of the Commander and General Staff, to be provided a staff of six officers, one of whom will be specially qualified in each of the following fields: Personnel, intelligence, operations, and logistics. The fifth officer will serve as Course Director, and the sixth officer will be in charge of non-resident instructional matters.

The next step in the chain of events required approval of the reorganization plan by the Chief of the Army Field Forces, General Jacob L. Devers. To gain this approval and to facilitate immediate implementation of the plan, Colonel Faith was designated to hand-carry the reorganization plan with an accompanying letter from General Eddy, to General Dever's headquarters at Fort Monroe, Virginia. In his letter to General Devers, General Eddy stated in part:

"c. For both the school years 1946-1947 and 1947-1948, the curriculum has been divided into a period of common instruction (30 weeks) and a period of specialized instruction (10 weeks). During the latter period the class is divided into four groups, each studying the duties of only one general staff section. This division of time has worked well, and it is planned to continue it next year.

"3. During the past two years, it has

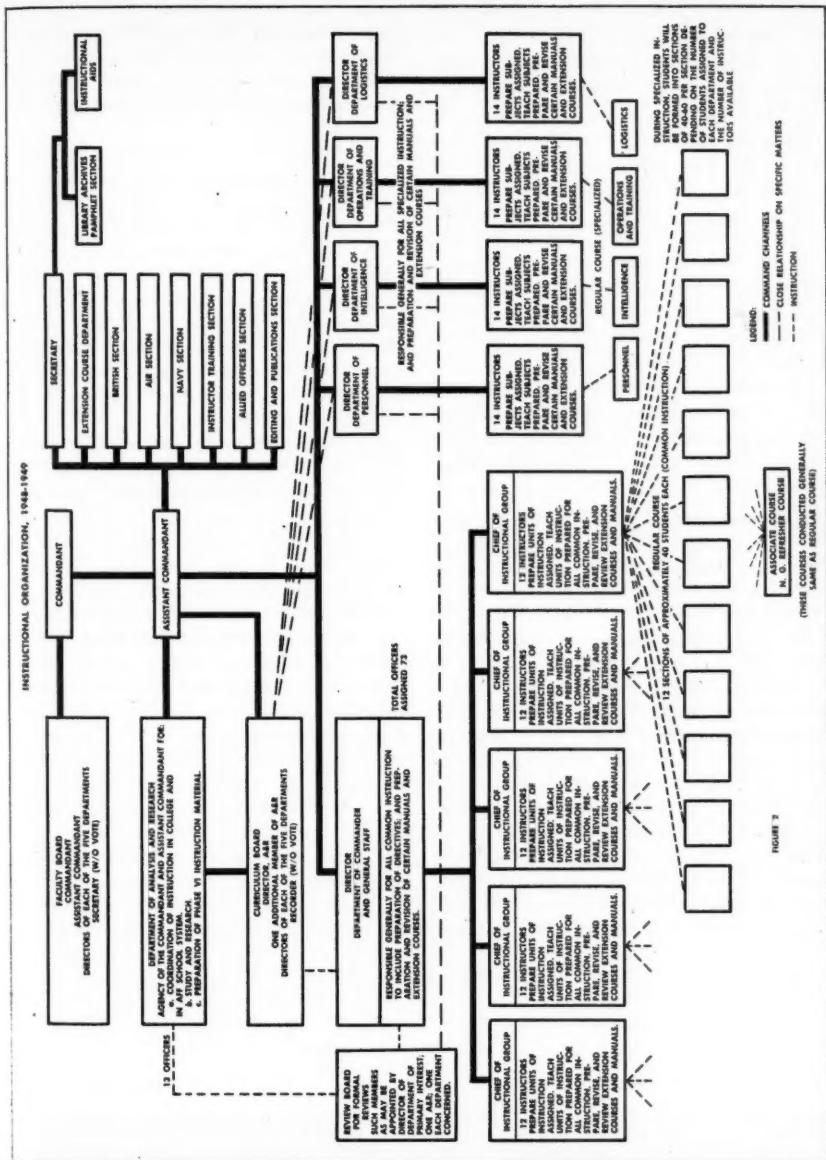
been the practice for the entire student body to receive instruction at the same time in one large classroom during almost all of the period of common instruction. I am strongly of the opinion that this practice—instructing 500 students in the classroom—constitutes an inferior instructional procedure which is not conducive to the most effective learning. Accordingly I had the matter thoroughly studied by a board of officers of the Faculty. As a result of the studies of this board, of consultation with the Psycho-Educational Advisor to the Commandant, and of conferences with key officers of the Faculty, I am convinced that it is desirable and practicable, without increasing the strength of the Faculty, to conduct common instruction next year in twelve groups of approximately forty students each.

"4. Effective implementation of the procedure just described will require the reorganization of the Faculty. In order to achieve maximum integration of common instruction, it is considered highly desirable to charge it to the responsibility of the commandant of one school, and to place under him the instructors charged with conducting common instruction. Since it is essential that common instruction be properly balanced among the fields of command, personnel, intelligence, operations and logistics, it is impracticable to assign this responsibility to one of the four schools currently authorized. The organization of a fifth school, with personnel approximately half the present faculty transferred from the four existing schools, is indicated."

General Eddy concluded his letter by stating:

"6. In view of the foregoing, authority is requested to modify the organization of the Command and General Staff College by:

a. Constituting a fifth school, to be



designated the School of the Commander and General Staff.

b. Redesignating the School of Combined Arms as the School of Operations and Training."

Upon his arrival at Fort Monroe, Colonel Faith was able to accomplish his mission in a minimum of time with results as indicated by the 1st indorsement to General Eddy's letter which follows:

"1. In view of the need for early action, the recommendations in paragraph 6 of basic communication are approved for immediate implementation, pending revision of Circular No. 378."

The indorsement was concluded by:

"2. It is understood that the content and character of the instruction imparted will not be changed by the reorganization proposed."

Implementation of Reorganization Plan

"... and from the tents the armourers, accomplishing the knights, with busy hammers closing rivets up, give dreadful note of preparation."—Shakespeare, *King Henry V.*

On 1 May 1948, the actual implementation of the plan for reorganization of the college for the academic year 1948-1949 was initiated. Colonel Young, then Commandant of the School of Combined Arms, was named the Commandant of the School of the Commander and General Staff. A total of sixty-five instructors were transferred from the four existing schools to the new school; the ultimate total number to be seventy-three, including the Commandant and his staff of six officers. The School of Combined

Arms was redesignated the School of Operations and Training. Preparation of instructional material into instructional units for the academic year 1948-1949 was initiated immediately and has progressed rapidly.

As of this writing, one other modification in the reorganization plan has been directed. On 7 June 1948, a letter from Army Field Forces to the Director, Organization and Training, Department of the Army, requested authority, for reasons of economy, consolidation, and efficiency, to call the subordinate "Schools" of the College "Departments." It was felt that this change would be in conformity with the previous modification of the title "Commandants" of schools to "Directors."

On 9 July 1948, authority was granted Army Field Forces to designate the various "Schools" of the Command and General Staff College as "Departments." Henceforth, these main subdivisions of the College will be referred to as "Departments" and their heads as "Directors."

Although the two post-war years at the Command and General Staff College were regarded as being experimental, they have proved that the instructional program is basically sound and will produce adequate results. Many superior instructional vehicles have been produced in the light of recent war experiences. The reorganization of the college as described in these pages represents just one more effort to maintain the Command and General Staff College at that level of pre-eminence it has enjoyed through the years in the field of army education.

The Armistice of Cassibile

Dr. Howard McGaw Smyth

This is the first of two articles from a chapter with the same title which will be published as Chapter IV of Part II, Volume II, of the History of the War in the Mediterranean Theater, a six volume series being written as part of the Official History of the U.S. Army in World War II. Dr. Smyth's account is based on Department of the Army records; personal papers of Ambassador Walter B. Smith; interviews with Ambassador Smith, General Lyman L. Lemnitzer, and Brigadier Kenneth W. D. Strong; and the Italian published works by Generals Castellano, Carboni, Zanussi, Rossi, and Marshal Badoglio. This, and the second article to be published in the October issue, are printed by arrangement with Military Affairs.—The Editor.

Introduction

BRIGADIER General Guiseppe Castellano, assistant to the Chief of the Italian General Staff, left Rome on 12 August 1943, and on the 19th at Lisbon secretly met Major General Walter B. Smith and Brigadier Kenneth W. D. Strong. They refused to discuss his plan for Italy to switch sides; they gave him

the text of the "short terms" of armistice which the Italian Government might either accept or reject; and in accordance with the Quebec memorandum composed by President Roosevelt and Prime Minister Churchill, promised merely that the terms might be modified in the future in proportion to the active aid which Italy would render against the Germans. General Eisenhower's representatives refused to discuss where or when the Allies would land on the Italian Peninsula, and insisted that the armistice, if signed, would be announced by both parties to it at the wishes of Allied Force Headquarters.

Because of Castellano's delay in returning to Rome, Badoglio sent Brigadier General Giacomo Zanussi as a second emissary. He was detained for a time by AFHQ in North Africa and then flown to Sicily before being permitted to report to his government. Meanwhile Castellano got back to Rome and was there instructed to return to the Allies and explain that because of the German occupation, the Italian Government dared not accept the Armistice unless the Allies would land fifteen divisions within striking distance of the capital.

* * * * *

On a plane piloted by Major Mancini,

At Cassibile, in Sicily, Allied and Italian officers negotiated the Armistice which accompanied the Allied Invasion of Italy, and made plans for Operation Giant Two to block the German seizure of Rome

Castellano and Montanari (civilian interpreter) reached *Termini Imerese* field (near Palermo) a little before 0900, 31 August. There they were met by Brigadier Strong and the whole party then transferred to an American plane which took them to Headquarters, Fifteenth Army Group at Cassibile, Sicily. General Zanussi was already there, having flown from Africa with Major General Smith. Zanussi informed Castellano in a general and rather superficial manner of the Long Terms.

At Cassibile there was a general conference of the two Italian generals and their interpreter with General Smith, Chief of Staff; Brigadier Strong, Assistant Chief of Staff, G-2; Commodore Royer Dick, Chief of Staff to Commander in Chief, Mediterranean; General Alexander, Commander of the Fifteenth Army Group; Brigadier General Cannon, Deputy Commanding General of the Mediterranean Allied Tactical Air Force; and Captain Deann of the British Army (who spoke Italian.) General Smith presided and opened the discussion by asking Castellano if he had full powers to sign the military terms of armistice. Castellano replied "No," but stated that he had precise instructions, whereupon he read the memorandum furnished by his Government: if the Italian Government were free it would accept and announce the armistice as demanded by the Allies; the Italian Government, however, was not free but under German control because of the German forces which had been considerably increased since the Lisbon meeting. Because of this situation, Castellano continued, Italy could not accept the condition that the armistice be announced before the main Allied landing: the Italian Government must be sure that Allied landings were in sufficient strength to guarantee the security of Rome, where the King and Government intended to remain, before it could hazard announcement of the armistice. Be-

cause of their inferiority in equipment the Italians would rapidly be eliminated if they faced the Germans alone. The German armies would next turn an undivided attention to the Allied invaders which would be, said Castellano, greatly to the disadvantage of the Allies. Castellano declared that his Government insisted that the main Allied landing be made north of Rome, and with a force of at least fifteen divisions.

General Smith bluntly declared that Castellano's proposal was unacceptable; the Italian Government should either accept the conditions as a whole, including the announcement of cessation of hostilities at the time of the Allied main landing; or, it had the alternative of refusing the armistice. He declared that it was only with great difficulty that General Eisenhower had been able to secure authorization from the Allied Governments to undertake discussions with the Italians, discussions limited to military matters and not regarding methods of proclaiming the armistice. Italy, he said, had been offered an anchor of salvation in the Quebec Memorandum, and General Eisenhower had full powers to modify the conditions in accordance with the degree of support which Italy would render in the war. If the Italian Government refused the present offer of armistice, with its proclamation on the day of the Allied landing in force as was planned by General Eisenhower with the approval of the American and British Governments, then, said General Smith, General Eisenhower would have no powers in the future to treat with Italian military leaders or to conclude an armistice. In such a case, General Smith remarked, negotiations would be taken up by the diplomats of the Allied nations who would necessarily impose much harsher conditions than those demanded by General Eisenhower. If, through refusal to proclaim the armistice at the time of the Allied debarkation, this

opportunity for a military armistice were lost, there would be in the future, said General Smith, no further occasion for military discussions. This remark was directed at Castellano's essential program of a military collaboration of Italy with the Allies by which the dynasty and the Government might yet maintain itself and save something from the disastrous wreck into which Italy had been plunged by the Fascist régime. If military discussions were ruled out in the future it would mean the non-participation of Italy in the war, the exclusion of any mitigation of terms in proportion to Italian aid to the Allies. These remarks of General Smith most clearly implied that unless the Italian Government now accepted the whole of Eisenhower's conditions, Italy would be simply a passive element during the rest of the war and her ultimate fate at the peace table would be determined purely on the basis of Allied wishes. As to the figure of fifteen divisions which Marshal Badoglio regarded as essential, General Smith said that if the Allies were in a position to effect a landing with such a force, they would not offer an armistice.

At this last remark General Castellano perceived that Allied plans called for a total of fifteen divisions to be committed in Italy, and not fifteen divisions in the main landing. General Smith declared, however, that the invasion of the Italian Peninsula would take place with or without Italian aid, implying that it devolved upon the Italians themselves whether the struggle would be long and devastating or relatively brief.

General Castellano failed completely to secure any modification in the Allied program of announcement of the armistice simultaneous with the main landing. Both Castellano and General Zanussi tried repeatedly to gain some indication of the place and approximate time of the chief Allied debarkation, but here

too General Smith refused any information.

General Castellano then declared that he could say nothing further, but would have to refer the decision to his Government. He was obliged to follow his instructions strictly. He raised the question of the Italian fleet: could it not go to Maddalena in Sardinia rather than to the Allied port, for this would soften the blow to the Italian people. He was informed that there could be no modification of the Allies' terms here; in any case the units of the Italian fleet in Taranto would not be able to reach Maddalena.

Castellano again tried to find out when and where the Allies would land. He asked with what measures they planned to protect the Vatican, and when they hoped to reach Rome. In response to his threat that the Italian fleet was intact, and, in the absence of agreement with the Allies, would not remain idle as it had done during the Sicilian invasion, but would attack the Allied convoys, General Smith replied with greater threats: whatever the German strength or Italian attitude it was the intention of the Allies to drive the Germans out of Italy regardless of any suffering that might thereby be brought upon the Italian people. Nothing, he said, could prevent Italy from becoming a battlefield, but the Government might shorten her sufferings by completely accepting the Allied proposals.

The Italian generals were faced with a cruel dilemma. Failure to accept the armistice offered by General Eisenhower, with the possibility of military collaboration which in turn could bring modification of the terms, would inevitably mean overthrow of the dynasty and disappearance of the régime. But an even more immediate threat was that the Germans would occupy Rome and seize the Government unless the main Allied landings were close to the capital. And the course

of the discussion revealed to General Smith that Badoglio and his emissaries were more afraid of the Germans than of the Allies. At Lisbon General Castellano had given full information regarding German troop dispositions in Italy: he now refused to do so stating that it was impossible in view of the trend of the discussion. The conference was inconclusive, but General Smith gained the very definite impression that the Italian Government would not pluck up its courage to sign and announce the armistice unless there were assurances that Allied troops would be landed in the Rome area to give the Government some measure of protection against the Germans.

General Smith was adamant in conference, but courteous in minor matters. He invited the Italian representatives, General Castellano, General Zanussi and Signor Montanari to lunch, where, after an initial embarrassing silence, discussions were resumed. General Smith remarked that if Italy lost this opportunity, her situation in the future would be much more difficult. Castellano reiterated his Government's contention: It would accept the armistice, no matter how harsh the terms, but asked only for postponement of its proclamation. The Italian Government, he said, would gladly offer military cooperation to the Allies, but Italy could not do this unless the Allies offered conditions making it possible. Castellano had divined from the conference that the Allied main landing would be south of Rome. He remarked to his host that Italian forces alone could not save the capital, nerve center of the nation, and he urged that the Allies in their own interest, should furnish help because if it fell into German hands it would take a costly battle to regain it.

General Smith then mentioned that there were several Italian divisions disposed around the city which should be able to sustain a German attack. Castellano referred to the discussion at Lisbon

saying that the armament of these divisions was so inferior to that of the Germans that they needed an Allied landing near Rome in addition to the main landing if the capital were to be saved. The American General then asked that Castellano make a specific request, bearing in mind, of course, that the general plan of operations of the Allies could not be changed because of the long and minute preparations requisite for amphibious operations. Castellano then requested: one armored division to debark at Ostia; and one airborne division to land in the vicinity of Rome.

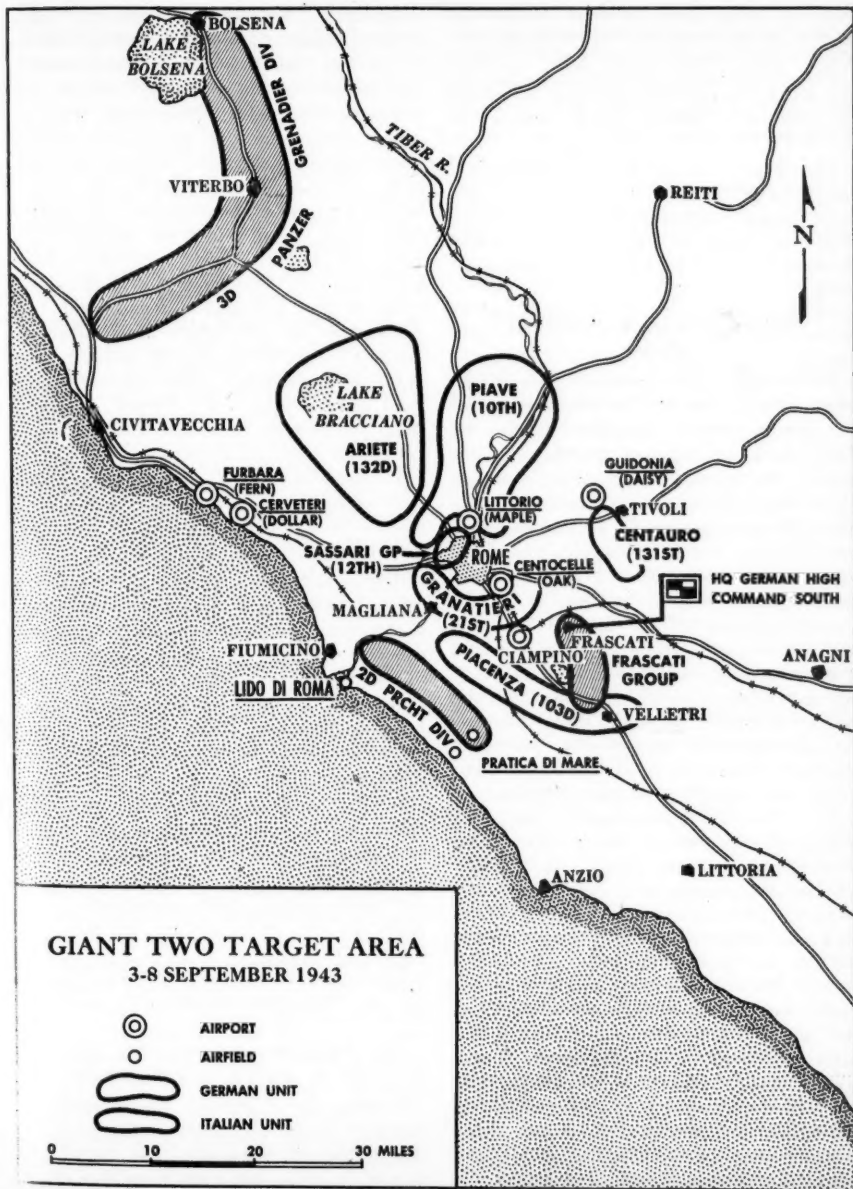
After the luncheon General Smith conferred at length with the other Allied generals. He then returned to Castellano and said that it would be very difficult to get the immediate concession of an armored division, but that it would be possible to obtain a paratroop division if the Italians would provide a couple of airfields. Castellano foresaw no difficulty about the airfields but insisted on the necessity of armored units to give the whole operation consistency; if an entire division could not be sent he stated it was indispensable that the Allies land some antitank batteries at the mouth of the Tiber on the day of the operation. General Smith assured Castellano that he would study the possibilities of such a project and would consider the landing of an entire armored division at a somewhat later time.

In the afternoon the results of the conference were summarized:

1. The Italian Government may accept or may refuse the conditions of armistice, but if it accepts it must accede to the methods desired by the Allies for the official declaration;

2. The Allies will effect the secondary landing with five or six divisions; during this landing the Italian troops cannot avoid offering resistance;

3. After a certain period of time (one or two weeks?) there will be the main landing south of Rome. The total force employed in both landings will equal, if not exceed the fifteen divisions regarded as necessary by Badoglio. Simultaneously



there will be effected the landing of the paratroop division in the vicinity of the capital and that of 100 antitank guns at the mouth of the Tiber;

4. Acceptance on the part of the Italian Government shall be made by radio within the twenty-four hours of 2 September. In the negative case no communication will be made.

Castellano, Zanussi, and Montanari left Cassibile airfield at 1600 in an American plane, transferred to the Italian plane at *Termini Imerese* and reached *Centocelle* airfield near Rome at about 1900.

Italian Government Decides to Accept

Immediately after landing at *Centocelle* airfield General Castellano hastened to the *Comando Supremo* where he found General Ambrosio to whom he reported the results of his discussions at Cassibile. Next morning, Ambrosio, Foreign Minister Guariglia, Acquarone, Minister of the Royal Household, and General Carboni met with Marshal Badoglio presiding to hear Castellano's report. Castellano presented his copy of the minutes of the conference at Cassibile and gave a detailed explanation of all that was said. He admitted frankly that he had been unable to obtain what the Italian Government desired—the postponement of the request of armistice until after the Anglo-American landing in force. The Allies, he stated, would not modify their plan of operations for a landing in southern Italy. The Allied chieftains, he explained, considered the Italian formations around Rome sufficient to defend the city. When he had insisted on the absolute inferiority of the Italian units in comparison with the adjacent German troops, he obtained from the Allies the promise of an American airborne division, of 100 pieces of artillery and of an armored division to be sent subsequently. Furthermore, he explained, the sending of these Allied troops would automatically entail the powerful support of Allied aviation.

Badoglio listened in silence, said nothing, and made no objection when Castellano had finished. He then asked Ambrosio's opinion and the Chief of the Supreme Staff agreed that there was no other course than to accept the conditions offered. Thereupon General Carboni spoke up in decided opposition. It would be Carboni, as Commander of the motorized army corps consisting of the four divisions (*10th Piave*, motorized division; *131st Centauro*, armored division; *132d Ariete*, armored division, and the *Granatieri di Sardegna*, 21st Infantry Division) on whom would devolve the task of defending Rome against German attack. General Carboni declared that the assurances of the Anglo-Americans were not to be trusted: they were oral promises, not a written agreement. Furthermore his army corps could not withstand a German attack because of lack of gasoline and munitions.

These remarks came as a very disagreeable surprise to Castellano inasmuch as Carboni had favored Castellano's mission to Cassibile. Hitherto Carboni had not mentioned a complete lack of munitions and gasoline. Badoglio expressed no judgment and dismissed the meeting saying he would refer the problem to the King.

In the afternoon (1 September) Badoglio received the assent of the King, and gave the order to General Ambrosio to notify the Allies by radio that the armistice terms were accepted. The telegram was sent in these words:

The reply is affirmative repeat affirmative period In consequence known person will arrive tomorrow two September hour and place established period please confirm.

The reply was received not long before 2300 at AFHQ on 1 September.

During the night of 1-2 September, General Smith sent two radiograms to Rome: the one requested that Castellano return to Sicily the next day; the other

assured Marshal Badoglio that plans were being studied for sending antitank guns to Rome and for the airborne operation. The Italian High Command was asked to indicate the airfields which could be used.

Planning GIANT TWO

Signature of the Short Terms:

General Castellano returned from Rome to Cassibile in the morning of 2 September. When General Smith asked General Castellano if he had full powers to sign, the Italian emissary said, "No." General Smith, however, permitted General Castellano to radio Rome asking for full powers to sign, and suggesting that his full powers be authenticated by message to Sir D'Arcy Osborne, British Ambassador at the Vatican. At 0400 of 3 September, General Castellano repeated the request to his Government for authorization to sign the armistice.

The reply of Marshal Badoglio, empowering Castellano to sign on his behalf, did not reach Cassibile until the afternoon of 3 September. Late in the evening of 2 September, however, a message from the *Comando Supremo* reached General Smith, indicating acceptance of the airborne operation and suggesting use of the airfields of *Centocelle*, *Urbe (Littorio)*, and *Guidonia*.

Discussion and planning of the airborne operation given the code name GIANT TWO began at 1430 on 3 September, which was even before the formal signature of the armistice terms, but after the Italian Government had indicated by radio its agreement to surrender. After a preliminary meeting in the early afternoon of 3 September of the Italian delegation with Allied officers, and an all night session of the Allied planners, an outline plan for operation GIANT TWO was completed by early morning of 4 September.

The afternoon meeting was largely exploratory. Major General L. W. Rooks,

Assistant Chief of Staff, G-3, presided and opened with the statement that "as time is short it is important to begin discussion on the operation without delay." As soon as conclusions could be reached they would be issued in the form of an aide-memoire.

The mission of the airborne division was defined: to cooperate with Italian units in the defense of Rome. General Castellano explained how the Germans would probably attack as soon as the Allied airborne division began landing. The *3d Panzer Division*, stationed between Viterbo and Lake Bolsena, could advance on Rome by three parallel roads, as the main German drive. Opposed to this force were two Italian units: the *Piave Division* immediately north of the city and the *Ariete Division* some fifteen miles out. Castellano believed that the commanders of these divisions would be able to choose a forward line of defense east and west in about the latitude of Lake di Braccia, and make the main defense just south of the lakes (di Braccia and Martignano). In the city was the *Sassari Division*, and to the south was the *Centaurio* which, it was implied would be able to oppose the German *2d Parachute Division*. The Italians did not lack men, he said, but lacked guns, and Castellano was particularly anxious for assurances that the Allies bring in artillery. The *Ariete Division* lay astride the roads by which the *3d Panzer Division* would advance, but it had no antitank guns and without these it could not hold up the Germans for more than twenty-four hours. Major General Ridgway, Commander of the *82d Airborne Division*, stated that his division had 57-mm antitank guns which could penetrate German MK IV and MK VI tanks at ranges up to 500 yards, and repeated that if aircraft could be landed, he could deliver heavy equipment by air. Additional equipment, the Italians were assured, would be brought by the seaborne

expedition, the specific planning for which lay outside the scope of the meeting.

The Allied officers were chiefly concerned with the protection of the airfields where the landings would take place, and to secure complete assurance that no Italian antiaircraft batteries would fire upon the planes when they came in low for landing. General Castellano gave a number of specific guarantees:

(1) that the Italian command would secure the dropping fields;

(2) that the antiaircraft defenses would not open fire;

(3) that a route, north of the Tiber, could be chosen which would pass over minimum AA defenses.

It was pointed out, and agreed to by General Castellano, that sufficient time would have to be allowed to enable a specific order to get down to every gun. The Italian General also promised:

(4) that Italian officers of high rank would meet the commander of the 82d Airborne Division on some field to be indicated;

(5) that all available intelligence would be furnished regarding both German and Italian units in the Rome area; and

(6) that navigational aids would be provided. The Italian broadcasting station announcing the armistice would serve as an aid to navigation, and the landing fields themselves would be illuminated; the outlines of the fields in orange-red lights; the outlines of the runways; and any obstacles within 500 yards of the fields by means of red lights.

General Castellano furthermore gave his assurances that the Italians would provide motor transportation for concentrating the airborne troops and supplies.

In the afternoon meeting General Castellano mentioned and briefly described the available fields:

Littorio (Urbe)—in the northern suburbs, good for aircraft but only fair for dropping because of its position in a loop of the Tiber;

Centocelle—southeast of the city, a very good field, but with limited night facilities;

The Race Course—opposite *Littorio*;

Magliana—on the river west of Rome, not yet fit for aircraft;

Guidonia—twenty-five kilometers northeast of Rome, the best and largest field;

Ciampino—southeast of the city, and not to be thought of since it was in the midst of German troops.

Castellano stated that the Germans, however, did not occupy any of the airfields. He suggested that the troops be landed at *Centocelle* and *Littorio* fields, and the heavy equipment at *Guidonia*. *Littorio*, just north of the city, seemed indicated as the point of concentration of the division, and motor transport furnished by the Italians would enable the men and equipment landed at *Guidonia* to be brought in rapidly. An Italian senior staff officer would meet General Ridgway at *Guidonia*. To reach these fields, which formed together a triangle with its base along the eastern outskirts of the Italian capital and its apex at *Guidonia*, it was suggested that the planes fly in from W.N.W.

During the afternoon meeting certain other things were briefly mentioned. General Castellano produced his maps showing the location of German and Italian units near Rome. General Rooks mentioned that consideration was being given to running two or three ships up the Tiber with ammunition and supplies, and Commodore Dick, Chief of Staff to Admiral Cunningham, asked if the swing bridges could be opened. Castellano stated that the bridge at Fiumicino could be kept open, and this would permit the ships to go as far as the *Magliano* airport where supplies could be landed along the banks. As far as *Littorio* field the Tiber was thirty feet deep. But he added that the area south of the Tiber was occupied by German troops who had AA batteries, and he felt that the flight line of approach should be about eight miles north of the river. Brigadier General Taylor, Artillery Commander, 82d Airborne Division, felt that such a route would be more difficult to find at night than directly up the Tiber, and urged that the German units south of the river be mopped up by the Italians as an

initial move. General Rooks asked if a small planning staff of the 82d Airborne Division could be sent to Rome in advance in order to complete details, a suggestion in which Castellano concurred, offering to take two or three American officers with him on a return trip to Rome on the morrow.

Towards the end of the discussion Brigadier General Timberlake, Assistant Chief of Staff, A-3, Mediterranean Air Command, asked whether, if the Allies brought a fighter group to the area, any 100 octane gasoline could be supplied to them. Major Vassallo replied that there was not much near Rome, but he believed it could be brought in, or obtained at some other agreed airfield, and asked when the fighters would arrive. General Timberlake stated that as soon as maintenance for some time was assured, there would be one hundred Allied fighter aircraft which would require approximately twenty-five tons a day. Major Vassallo stated that no airfields nearer than thirty or forty miles to the city could be used by the fighters, and suggested *Cerveteri* (near the coast and on the road to Civitavecchia) and *Tarquini*. General Ridgway then declared that he had sufficient information to draft his outline plan and the meeting adjourned.

At about 1400 hours on 3 September, the expected radiogram from Badoglio himself arrived:

Present telegram is sent from Head Italian Government to Supreme Commander Allied Force. Number eight. Reply affirmative given with our number five contains implicit acceptance armistice conditions.

This was not, however, an authorization for Castellano to sign. At about 1700 hours Captain Deann brought Castellano the telegram empowering him to sign, also signed by Badoglio:

Our number eight is cancelled. General Castellano is authorized by the Italian Government to sign the acceptance of the conditions of armistice. The Declaration which you requested with your No. 19 will be delivered today.

At 1715 hours General Castellano signed

the text of the Short Terms on behalf of Badoglio, and General Smith signed on behalf of General Eisenhower who flew from North Africa to witness the ceremony.

General Eisenhower and his staff were intent on securing the maximum possible aid from the Italians, and on completing plans for the cooperation of the 82d Airborne Division with the Italian Motorized Corps near Rome. In reporting the conclusion of the surrender of Italy on the basis of the Short Terms, he wired the Combined Chiefs of Staff that formal signature of the Long Terms would take place later and would be timed to fit Allied operational plans, but the signature of the Short Terms was absolutely necessary as a basis for making specific military plans with the representatives of the Italian Government and High Command.

At 2030 another meeting was held to discuss the general action to be taken by the Italian Government in consequence of the armistice. General Alexander presided. Just before this meeting General Smith handed Castellano a copy of the original Long Terms entitled "Instrument of Surrender of Italy" with a brief note stating that the attached document:

Contains the political, financial and economic conditions which will be imposed by the United Nations in accordance with paragraph 12 of the Armistice terms. The military conditions of the Armistice are contained in the document which we have just signed. The attached paper is identical with the one handed to General Zanussi by H. M. Ambassador in Lisbon.

General Castellano, who had managed to avoid the phrase "unconditional surrender" in the Short Terms, and who had initiated the planning of a joint Allied-Italian operation for the defense of Rome, was painfully surprised by the Long Terms which contained the harsh initial clause:

The Italian Land, Sea and Air Forces wherever located, hereby surrender unconditionally.

He protested against this manner of procedure on the part of the Allies to

which General Smith replied that a copy of the document had already been given to General Zanussi in Lisbon and was therefore known to the Italian Government. Castellano, however, expressed a doubt that his Government would ever accept the additional clauses. It seems clear between the lines that neither General Eisenhower nor General Smith was ever very happy about the Long Terms and the order from the Combined Chiefs of Staff to secure their acceptance by the Badoglio Government. In any case, General Smith reminded Castellano once more about the Quebec Telegram to which Castellano replied that that message contained only general promises; he saw no basis for recourse by his Government in case these promises were not maintained. Thereupon General Smith with his own hand wrote a note to Marshal Badoglio stating that:

The additional clauses have only a relative value insofar as Italy collaborates in the war against the Germans.

Some time that same evening of 3 September Commodore Dick handed Castellano a memorandum containing the instructions for the movement of Italian warships and merchant shipping.

Meanwhile General Ridgway and his planning group had been working out an outline plan for GIANT TWO on the basis of the discussion with Castellano during the afternoon. Their primary worry was that the Italian authorities might not be able to silence every gun in Rome's belt of antiaircraft defenses. In such a case the unescorted C-47s would be shot like clay pigeons as they came in low for the dropping of paratroopers or for landing supplies. They remembered 18 April of that year when Allied fighters had intercepted and shot down seventy-three Junker 52s which were attempting to bring supplies into Tunisia. They remembered even more vividly the unfortunate experience in the attack on Sicily when twenty-three of their own trans-

port aircraft had been shot down by Allied fire.

The original outline plan, based on the use of *Guidonia*, *Littorio* and *Centocelle* airfields, seemed very risky indeed to General Ridgway and General Taylor who expressed through General Lemnitzer to General Smith and to General Alexander their belief:

that no reliance could be placed upon the degree of cooperation from Italian Military Forces which was considered essential to success of the airborne mission as outlined.

General Castellano was called in for consultation and he was less certain than he had been during the afternoon of the ability of the Italian Supreme Command to guarantee that no Italian guns would fire upon the Allied planes. In the earlier meeting he had followed the instructions of his Government and suggested the *Guidonia*, *Littorio*, and *Centocelle* airfields for the airborne landings. Under pressure of Allied questioning Castellano was forced to admit the enormous difficulty of silencing every gun in Rome's antiaircraft defenses, and the *Centocelle* and *Littorio* fields lay right in the midst of extensive flak batteries. He proposed therefore that the initial drop be made at *Furbara* and *Cerveteri*, two fields which were slightly to the north of the capital, but right on the coast, about twenty-five miles to the west and along the Via Aurelia on Highway No. 1. These fields lay quite outside the belt of Rome's air defense batteries, they were completely in Italian hands and the Italian 7th Infantry Division (*Lupi di Toscana*) was scheduled to effect its concentration on 8 September, between the two fields. Believing these fields to be unknown to American aviators, he supplied the Allied planners with considerable precise information about them, something he was easily able to do.

The Outline Plan, as completed during the night of 3-4 September differed

considerably from what had been contemplated during the afternoon discussions. It was now planned to make the initial landings at *Cerveteri* and *Furbara*, and only on the second night (second lift) to drop parachutists on the zones of Daisy (*Guidonia*), Maple (*Littorio*), and Oak (*Centocelle*). The airborne division was to assemble and reorganize in the western exits of Rome, not at *Littorio* field.

The Outline Plan carefully defined the responsibilities of the Italian forces. First, *provision and protection of the airfields of Guidonia, Littorio, Centocelle, Cerveteri and Furbara*. All the anti-aircraft defenses of these fields were to be manned exclusively by Italian forces who were to be given explicit orders against firing on any aircraft throughout the night of X day and throughout the nights of the subsequent lifts. General security of the area of the fields was to be provided by the Italian troops who were to block the avenues of approach of the Germans, furnish ground forces for local protection of the various airfields and drop zones, and guarantee unmolested passage of naval craft up the Tiber to Rome.

Second, *a number of navigational aids to the airborne flight were specified*: a horizontal searchlight beam pointing due west at *Furbara* field, and two Rome radio stations broadcasting throughout the night. On each field the perimeter was to be outlined with amber lights, the airborne runway to be marked with white lights.

Third, *the protection of the formations in flight*. The Italians guaranteed to remove or silence all AA for a corridor ten miles on each side of the Tiber, and for a short secondary corridor of the same breadth from the sea to the fields of *Cerveteri* and *Furbara*.

Fourth, *specific arrangements for the reception of the American forces at the*

arrival airfields. A senior staff officer of the Italian Motorized Army Corps was to meet General Ridgway at his arrival on *Cerveteri* airfield on the night of X day. On each of the fields there was to be a senior officer charged with reception of U.S. troops, and one interpreter-guide per company (about fifty in all for the night of X day).

According to Castellano's memoirs, he obtained during the course of the discussion, an agreement that "the American division would be placed at the orders of General Carboni." This assertion is not altogether accurate. The mission of the 82d Division was to "secure the city of Rome and adjacent airfields and prevent their occupation by German forces," and this was to be achieved "in cooperation with Italian forces." But it was stipulated that "English is accepted as the language of communication between Italian and U.S. forces." Before leaving for Rome on his secret mission to complete the details of the joint action, General Taylor used these words to describe the relationship of the 82d Division to the Italian forces:

The airborne troops upon arrival will cooperate with the Italians in the defense of Rome and comply with the recommendations of the Italian High Command without relinquishing their liberty of action or undertaking any operation or making any disposition considered unsound.

The Outline Plan stipulated also the Italian logistical aid to the Airborne Division, a total at the various fields of: 11,000 rations, 355 trucks, and twelve ambulances.

In the assembly area of the division (the western outskirts of Rome) there was to be supplied: 120 tons gasoline and oil, 12,000 rations, fifty miles of field wire, twelve switchboards, 150 field telephones, 100 picks, 200 shovels, 5,000 wire pickets and 100 miles of barbed wire, if possible. In addition a labor pool of 500 men was to be provided in the division assembly area by the second day. The

Americans undertook to bring in rations for two days, gasoline for a day, medical supplies for the initial period, and ammunition for the whole operation.

After completion of the Outline Plan for GIANT TWO, about 0800 hours on 4 September, detailed orders were prepared for its execution. The first lift, on the night of the armistice announcement, was to transport the 504th Regimental Combat Team to the *Cerveteri* and *Furbara* airfields with an engineer company, a signal company, ammunition, and an anti-aircraft battery. The second lift, on the second night, was to airdrop the 505th Parachute Infantry Regiment on the *Guidonia*, *Littorio* and *Centocelle* airfields. It was planned to work out details for three subsequent lifts after execution of the first two.

By the afternoon of 8 September, everything had been prepared and the planes of the first lift were ready to take off. But the Americans were still doubtful of the ability of the Italians to fulfill the promises made by General Castellano. Accordingly two officers were secretly sent to Rome to verify the situation and make final arrangements for co-operation with the Italian High Command.

General Taylor and Colonel William T. Gardiner composed the mission, carrying verbal orders from AFHQ and the Fifteenth Army Group to complete in Italy the arrangements for GIANT TWO. They left Palermo at 0200 hours 7 September and were brought to a rendezvous off Ustica Island by a British PT boat and transferred to an Italian corvette. Under the escort of Rear Admiral Maugeri they were taken to Gaeta, put into an Italian navy sedan and at the outskirts of town were transferred to a Red Cross ambulance which drove them to Rome without incident although they passed some German patrols along the Appian Way. The American officers wore their uniforms which had been intentionally splattered with water in order that they might appear to be aviators shot down and rescued from the sea. Just at nightfall they entered Rome where they were received at the Palazzo Caprara (opposite the War Office) by Colonel Giorgio Salvi, Chief of Staff to Carboni, Lt. Lanza, and Major Marchesi. At the insistence of the American officers, a conference was hastily arranged with General Carboni. When he arrived at 2130 the American officers received a great shock, for he wanted to call the whole thing off.

Despite our generous aid in relief and reconstruction, the vacuum that might tempt a military adventure in Central or Western Europe has involved us in a struggle where power has once again become the arbiter of decision. Therefore, even as we continue to strain toward peace through justice, even as we subscribe to United Nations with the full force of our convictions and with belief in its eventual triumph, we are left with no present-day choice but to arm ourselves if we are to champion its principles as our own. For if in this period when power politics have clouded the council chambers of nations we ignore the need for competent military strength, we may be forced to abdicate a share of the leadership we bring to the world. And the abdication of vigorous strong democratic leadership anywhere at this time can only result in strategic gains for those who would oppose us.

General Omar N. Bradley

Tomorrow's Submarine

Rear Admiral M. R. Browning, USN (Ret.)

WILL recent discoveries in the fields of atomic fission and supersonics result in the appearance, in the navies of tomorrow, of mammoth underwater craft? It is an interesting and stirring question.

It is the writer's opinion that such giant submarines cannot be looked for in the near future. Furthermore, it is his conviction that the ocean-going submarine of the next few decades will not exhibit any revolutionary—or, in fact, even extraordinary—changes in size, displacement, or shape, from those which are currently accepted as typical.

The premise upon which that conviction is based takes cognizance of the new weapons and techniques comprised in the advents of the atomic bomb and supersonic speeds. It also embraces World War II appearance of, and improvement in, electronic apparatus, the advances which have been made so recently in submarine performance, particularly submerged, and the host of implications which all these, together with their inevitable refinements and extensions to come, hold for the future.

But to foresee no imminent major changes in size, displacement, or shape of undersea craft is by no means to fore-

cast a period of stagnation in their progressive material improvement as sea-going and combatant vessels, or in their expanding usefulness as adjuncts of sea power and national war potential. On the contrary, instead of falling victim to any paralysis or military eclipse—either temporary or permanent—as a result of the new discoveries, the submarine has, in fact, drawn new vitality from them and particularly from those associated with atomic fission and supersonics. This added potency neither presupposes nor requires any basic revisions in the knowledge and experience which have been accumulated in the past fifty years, or in the physical characteristics of the ships themselves which that knowledge and experience have evolved and crystallized in the form with which we are today familiar.

That is not to say that atomic explosives and supersonic attack are—or necessarily ever will be—ineffective against submarines. The most casual hearsay acquaintance with the destructive power of an atomic detonation should suffice to convince any student of that. The Bikini tests provide further and conclusive proof. But in science and in war-

Submarines of the future will not necessarily be of mammoth size, although in the new era of atomic energy and supersonic speed they will be technically improved, more efficient, and adapted to new uses

fare there are few terms which are absolute, and "effectiveness" is not one of them. The effectiveness of the new weapons is a relative value; relative, that is, to the expense and difficulty of producing them and getting them to their targets, relative to the number of those targets and their ability to evade hits, and relative, too, to the capacity of those targets to deliver effective counterattack.

The evidence we have, together with the conclusions reached by analysis and deduction, does not establish *merely* the fact that the new weapons are effective against submarines, just as they are against any and all other mobile military units. That same evidence presents with equal force the additional facts that the same weapons and their associated phenomena open the way to technical improvements in submarine armaments, propulsion, methods of ship control, performance and tactics, which promise not only to make the submersible of tomorrow more efficient in its conventional combat roles, but also to give it a new and hitherto unexploited value as a supply and transport vessel.

"Find Him; Fix Him; Fight Him"

This is one of the many clichés which have emerged from man's effort to reduce the principles of warfare to epigrammatic form. The identity of its original author has been lost in the years, but nearly all military men are familiar with the saying. Hackneyed though it is, it provides as succinct an axiom as any ever coined. It embraces the pith of combat and there are no exceptions to its rule; all three are essential to victory. Atomic fission and supersonics have not and cannot change it; neither have radar and allied electronic discoveries. True, the latter two have made the "finding" and the "fixing" possible under circumstances in which they could not be accomplished before, and atomic bombs and guided missiles will undoubtedly make destruction

(the aim of the "fighting") more swift and certain than before, but you will always need to "find and fix," before you can hope to "hit," and so destroy, your enemy.

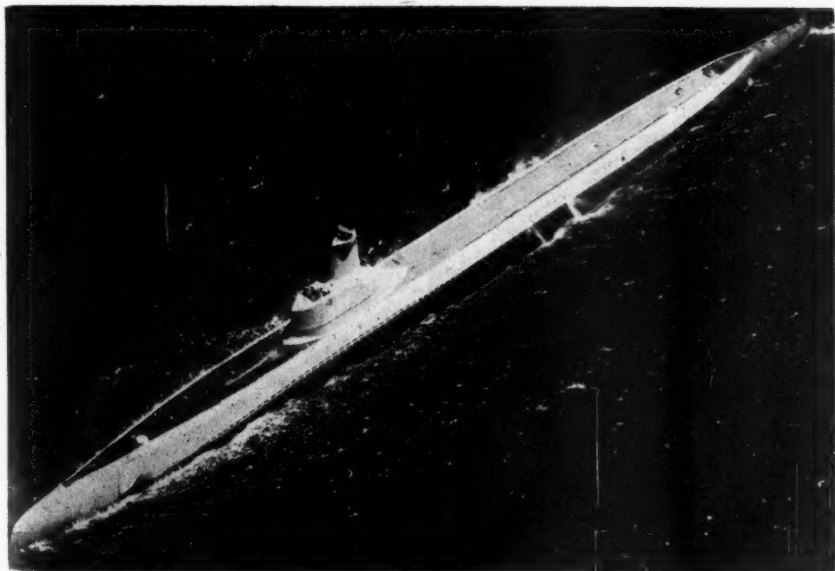
There is little to be gained by entering into any lengthy quantitative discussion of just how effective fission explosions may prove against submarines. Whether tomorrow's A-Bomb or A-Missile will destroy a submarine within a radius of a half-mile or of ten miles is not the crux of the matter. Neither is the question of to what degree deep submergence may reduce their lethal radius. These are both highly controversial subjects, and the specific values which time and experience will eventually educe for them are of secondary importance as compared with the fact that the submarine must first be located before attack can be launched.

It is here that the unique ability of the submarine to submerge quickly and to operate submerged pays its equally unique dividend. No way has yet been devised to locate a completely submerged vessel at sea except by getting very close to it. To deliver—or to control—the fire of an atomic explosive, whether by bomb, depth charge, or rocket, from such juxtaposition to the point of aim would seem to be neither practicable nor healthy. If adequate delay to provide safety for the contacting unit is inserted in the attack, the target's location will no longer be known. Whether or not, in the years to come, such a thing as an atomic barrage will become practicable is open to question. That would appear to be the only solution to the problem of hitting a submerged submarine with which contact has been broken off. From what is now known, such prodigality of atomic expenditure seems unlikely in the foreseeable future.

Let it be repeated; it is not easy to locate a submarine at full submergence.

If and when one is so located, it is also difficult to track it with sufficient accuracy to permit fire to be opened upon it with any weapon so far used against the type. This has proved to be the case in past years against undersea craft of conventionally familiar performance capabilities. Those difficulties will be found to have been multiplied immeasurably by the recent successful development of

formance thus made possible cannot normally be tracked by sound with the equipment presently available. Whether, if ever, this inability to "fix" such a sub, once located, will be overcome, remains to be seen. The United States Navy has recently announced a program calling for four of these new "fast" submarines and for the conversion of two of our older ships. The successful completion and



USS Pomodon, American submarine streamlined to increase its underwater speed.—US Navy photo.

closed induction power plants for underwater propulsion, and the resultant enormous increases in submerged speed and endurance. The Germans first developed such power plants, their experimental "Walter" boats having made their appearance at sea shortly before VE-day.*

Submarines with the submerged per-

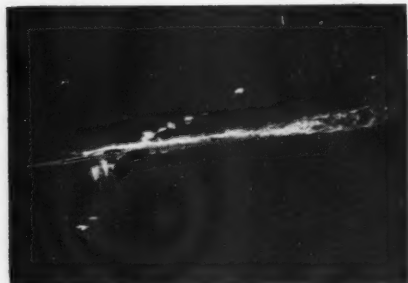
formance of these vessels will sound the knell of conventional techniques of anti-submarine warfare. Other powers may confidently be assumed to be following the same lines of development, since the knowledge of the "Walter" boats was no secret from any member of the United Nations at the close of World War II.

In effect, "fast" submarines such as these will mean: (1) it will be vastly

* See "Submarine Warfare," *MILITARY REVIEW*, April 1946.

more difficult to locate them initially: (2) it will be practically impossible to track them if they know or suspect that they are being hunted, unless there has been devised some means not now existent for so doing.

The "finding" and the "fixing" part of anti-submarine measures will thus have become magnified to a point where they will constitute perhaps 99 per cent of the entire problem. Under these circumstances, it is a reasonable assumption that, *until and unless atomic explosives become far more plentiful, adaptable, and easy to handle than there appears*



German submarine under attack by planes of a US escort carrier in World War II.—US Navy photo.

any ground to expect for a great many years to come, it is unlikely that they will be used against submarines.

A-Batteries on Submarines

What of the possible employment of atomic explosives and guided and rocket missiles by the submarines, themselves? Here the case is very different, for while in *anti-submarine* operations the target is always and solely the submarine, in *offensive* submarine warfare the target may be anything from an industrial center to an air base, on land, or from a battleship to a tanker, at sea. The military principle of economy of force, para-

mount as a veto power in the evaluation of atomic explosives *against* the sub, lends direct support to their employment *by* her against a wide variety of such targets available to her. Both the chances of a hit and the value of the results of one are sufficiently high to make it pay.

With respect to such targets on land, their physical size and their immobility combine to invite the use of missile attack carrying atomic explosive. Pin point accuracy would not be a *sine qua non*, with the result that relatively long-range fire would be effective. This factor is of vital importance in attempting to evaluate the future use of submarines equipped with missile batteries for bombardment of shore installations. The limit of the range within which she could control the flight paths of her missiles for fire against large fixed targets would then be the only limit on the extent of the area which a sub could command back of an enemy coastline. The recently retired Chief of Naval Operations, Fleet Admiral C. W. Nimitz, in a statement released on 6 January, painted a terse picture of this extension of bombardment operations by submarines. Referring to the employment of carrier aircraft and "surface ships and *submarines* projecting guided missiles and rockets," Admiral Nimitz went on to say, "If present promise is developed by research, test and production, these three types of air-sea power operating in concert will be able *within the next ten years* critically to damage vital areas many hundreds of miles inland."*

In addition to the promise of lending greatly increased potency to submarines as offensive weapons against land objectives, atomic explosives may well multiply vastly the power of the type in combat with surface ships. When a submarine can attack with a missile whose single direct hit is sufficient to insure com-

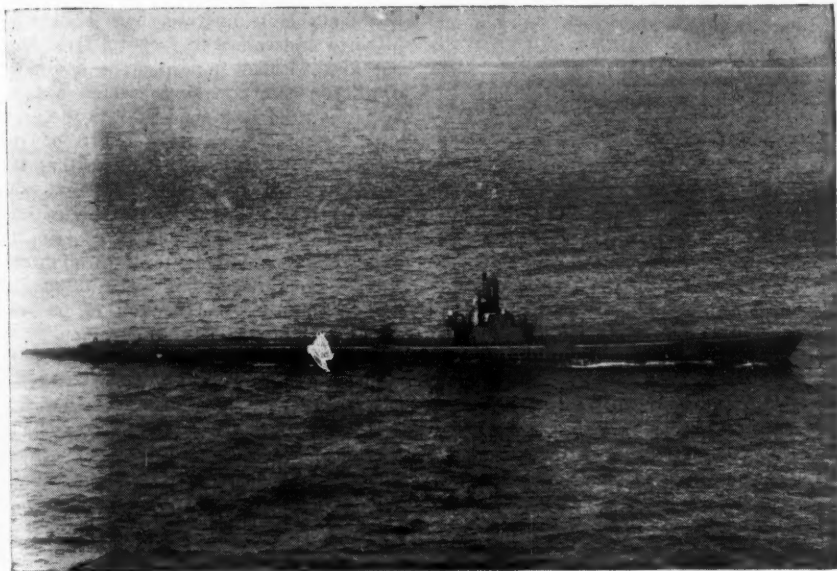
* The italics are the author's.

plete destruction of any vessel, no matter what her size, construction, and armament, the parallel of David and Goliath no longer fits.

As far as the physical practicability of mounting such batteries on submarines is concerned, there appears to be little ground for question. The German V-2

as to the feasibility of launching the missiles of ten years from now from any modern warship of submarine size or larger.

There is strong probability that within the next two decades we may find submarine batteries using not only atomic-loaded guided missiles and rockets, but



USS Sea Dog, submarine used in World War II.—US Navy photo.

rocket has already been launched in successful experiments from the deck of the *USS Midway*. The United States Navy has just recently announced that it is not discarding plans for the use of missile ships. Admiral Nimitz has made the clear-cut prophecy quoted above. Finally, there is the force of our own logic and observation; if the clumsy German V-2 can be launched today from a carrier without major structural changes having to be made first, there should be no doubt

torpedoes whose warheads and power plants are atomic, as well.

Atomic Power Plants

A significant statement was made by Dr. Karl T. Compton, president of Massachusetts Institute of Technology, in a speech before a gathering at Atlantic City on 9 February 1948. He is generally considered to be one of the best informed men in the world on the subjects of atomic fission and atomic energy. Dr. Compton said, among other things, that atomic

power plants "may be developed" for warships and commercial vessels in the course of the next ten years.

When they arrive, what will be their impact on the underwater performance of the submarine; on her speed and her capacity for quick maneuver, both in azimuth and in submerging and surfacing? What, too, will atomic propulsion do for the underwater missile, the torpedo? These are questions which quicken the imagination, but concerning which our tiny store of knowledge provides little basis for precise speculation.

New Uses

The submarine is now crossing the threshold of a new era in tactical employment and strategic use. Henceforth, in addition to its classic combatant tasks, we may expect to see the type utilized on an extensive scale as a wartime cargo carrier. Whether or not there will be added to this new function the duty of personnel transport must remain to be seen; probably not to an important degree, for there is no reason to believe that amphibious war on a major scale will feature future conflict any more than it has past, until after the necessity for sub-surface transportation of troops has been eliminated.

In other words, the fundamental lessons of the amphibious campaigns of the past still hold good; no belligerent can hope to bring off successfully an overseas invasion until he has secured adequate mastery over the sea lanes leading to, and the sea areas adjacent to, the enemy coast. When this condition has been fulfilled, the great need for undersea communications will have been eradicated in the theater, and the more efficient conventional employment of surface ships can be instituted. However, until that condition obtains, the projected forces in forward sea areas and at land outposts must be provided with adequate supply, and it is in this task

that the submarine will find her greatest value in her new role. Capable of speeds approaching thirty knots submerged (and quite possibly far greater), and of twelve hours or more endurance at any depth, it calls for little effort of the imagination to realize the almost complete immunity from detection and attack which the ships can enjoy while maintaining lines of communication. Not only will they be able to operate those lines with hitherto undreamed of freedom from loss, but also without imposing the enormous drain for escort strength which has always featured such operations in the past.

In touching upon this phase of the subject, it is interesting to note that the Germans pointed the way here as far back as World War I, when the *Deutschland* made her memorable cargo trips to and from the United States through the British blockade before we entered the war. Again, in World War II, it was the Germans who employed U-Boat "sea cows" to fuel and provision their submarine packs in the Atlantic. Japan, also, from November 1942 on, made use of her fleet subs to keep touch as long as possible with her collapsing chain of island outposts. But in Japan's case it was an enforced emergency measure for which she was ill-prepared. Now, the United States Navy has recently announced that one of the fleet submarines being modernized this year will be fitted as an oiler for her sisters. This is the first time this has been done in our navy—the opening move in inaugurating the regular employment of the type as a fleet auxiliary.

Size and Shape

At the outset of this article, the statement was made that the writer does not believe that extraordinary increases in size or displacement, or significant alterations in shape, will feature the submarines of the next few decades. That opinion is based upon two fundamental

principles in submarine construction and operation which have been in no wise affected by the discoveries and new techniques which have appeared in the course of the last five years.

Briefly, those two principles comprise the facts that the submarine *must* be capable of submerging quickly and to relatively great depths and *must* be capable, also, of proceeding and maneuvering while so submerged. Without the ability to do both, she is, for wartime purposes, useless.

Both these factors work to the same end in so far as her design and construction are concerned; that is, they force upon her a pressure hull generally cylindrical in shape to provide the strength necessary to withstand the enormous pressures under which she must operate, and an over-all size and shape which are compatible with the flexibility of maneu-

borhood of 1,600 tons. Since about 1910, there have been many attempts, in the form of experimental craft, to produce successful vessels of measurably greater size. Every naval power in the world has made at least one such essay, seeking to eat the cake and have it too, so to speak, by increasing either the offensive fire power, or the cruising range, or the carrying capacity, without sacrificing hull



Close-up view of the German *Schnorkel* "breathing" device, developed to bring air into submerged submarines.—US Navy photo.

ver which she requires in both the horizontal and vertical planes.

From the past fifty years of experience, there has emerged a fairly clear-cut optimum in these features for the fleet submarine. The present United States fleet types exemplify that optimum; vessels of moderate size, whose lengths average approximately 300 feet and whose surface displacements are in the neigh-



Japanese 5-man submarines under construction at the Kure shipyards at the end of World War II.—US Navy photo.

strength or maneuverability. In every such instance so far, the experience gained has dictated a return to a smaller ship for over-all efficiency.*

In addition to the unsuccessful "super-submarines" mentioned in the preceding paragraph, most maritime powers have built ships markedly smaller than those characterized herein as typical fleet subs. The vast majority of the German World

* However, in an article entitled "Our Disappearing Merchant Fleet" published in the March 1948 issue of *The American Legion Magazine*, Donald B. Robinson makes the following statements: "The Navy is particularly interested in intelligence reports on Russian shipbuilding.... Reports have also come that the Russians, with German help, have developed submarines which can cross the Atlantic submerged, can carry three bombing planes and twenty torpedoes, and can make the hitherto undreamed of underwater speed of twenty-six knots. . . ."

War II U-Boat fleet consisted of vessels of about 500 to 700 ton surface displacement. These boats, however, were produced to meet a specific and peculiar situation, in that the German high seas fleet, as such, did not really exist, and the U-Boat force was never intended to function as a fleet component. The subs were not designed or equipped for any work except that of attacking the slow allied shipping which carried the bulk of supplies from America to Europe—shipping whose vulnerability was such that smaller, slower and less formidable ships were fully as effective against it as would have been larger and more expensive vessels. Another familiar example of the small sub is the "Midget," a type which appeared in considerable numbers during the last war, and which enjoyed a measure of minor tactical success. The "Midgets" were not ocean-going vessels in the accepted sense. They were de-

veloped for inshore work only, and because of their extremely limited field of usefulness they did not form important offensive components of any fleet. In their present form, they have no real strategic significance.

If the forecast made throughout this discussion should prove wrong, and drastic changes should, in fact, be made in ocean-going submarine sizes in the next few decades, it is far more likely that those changes will be toward a *smaller* craft than toward a larger. A giant undersea vessel is not a practicable concept today because it cannot be built to take the strains of deep submergence and rapid underwater maneuver. The same basic unfitness for operation which doomed the enormous rigid airships of a few years ago would act in similar manner to vitiate whatever claim to existence might be advanced for the mammoth submarine.

... Many people thought ... the Bikini atom bomb tests would prove the Navy obsolete. Actually, no peacetime test of any kind could be capable of such proof. The only thing which can drive the Navy from the seas—and out of the air over the seas—is the winning of a war without needing the sea itself, either for fighting or as a highway. If it ever becomes unnecessary to move men or material by sea during a major war, the Navy's primary mission ceases to exist. For its principal job is to control the sea, so that we may use it and the enemy may not—for transportation purposes. Sea power—the power to *control* the sea—means therefore also the power to *use* the sea. It embraces, not just the Navy, but the Merchant Marine. ... Most important of all, it means the men themselves who go to sea, those who fly naval aircraft, and those ashore who help to train them and administer their affairs. ...

Admiral W. H. P. Blandy

Until international control of atomic energy is established, we must continue to develop atomic weapons. In the next few years, atomic explosives may be adapted to rockets and other missiles, suitable for firing against land targets from warships and submarines.

General Jacob L. Devers

Strategic Censorship in World War II

Colonel H. M. Forde, *Cavalry*
Instructor, Command and General Staff College

CENSORSHIP during World War II consisted of the examination of written and printed matter with the view of suppressing objectionable items or forbidding their publication, and of obtaining information of value in the prosecution of the war.

The two purposes of censorship are important. The first denies to the enemy that information which would be of assistance to him. The second enables us to exploit for our own purposes such information as may be of value to us.

Within the armed forces, censorship is relatively easy to establish and to enforce. Military censorship is primarily occupied with personal letters of the members of the forces and the news submitted by press correspondents. Not much of intelligence value can be obtained from this source. Suppression of communications containing information of proposed operations, troop movements and identifications, and the results of enemy action, are the chief concern. The strict control exercised by the military authorities simplifies the problem of censorship.

Censorship of civilian communications is a much greater problem. The control of the civilian population is more loose, discipline is more lax, and the immense volume of communications demands a

large organization to handle the problem.

Civilian Communications

Censorship of civilian communications includes the examination of business and personal communications, and the supervision of the press, the radio and motion pictures. Any means employed to transmit thought from one individual to another, save direct speech itself, must be subject to control.

Control of radio broadcasts and of the press was exercised through a system of voluntary censorship. Lists of restricted items were prepared in the Office of Censorship and distributed to all editors and managers of radio stations. These lists were prepared with great care to insure that only such items were included as definitely endangered national security. How the material was presented, if it did not violate the restricted lists, was of no concern to censorship.

The possibility that an enemy agent might use a radio broadcast to communicate secretly with his superiors was proved even before the start of the war. An un-named military intelligence officer adroitly wove into an interview with Max Baer a coded reference to ship movements. This was accomplished through a

Censorship in World War II served two important purposes: It denied the enemy information which would be of help to him, and it enabled friendly forces to exploit information of value to their own cause

passing mention of Queen Elizabeth in a regal, not a nautical, sense. To the uninformed, the script was natural and innocent. When the officer disclosed the ease with which he had arranged the message, the entire radio industry suffered from goose pimples. It was not difficult to induce the radio industry to eliminate the audience participation or "man on the street" broadcast.

In the United States, censorship of the press was largely a matter of salesmanship. Newspaper editors scoffed at the idea an enemy would depend upon the press for information. Intercepted clippings enabled censors and intelligence officers to answer the objections by presenting definite proof that enemy agents did depend upon news stories and magazine articles for a surprising amount of information. Subsequent compliance with the announced restrictions was immediate and almost complete.

Successful supervision of business and personal communications depended upon alert, skilled personnel. Specialized backgrounds in finance and various businesses were necessary to personnel charged with the examination of business communications. Speed in clearing the letters, cables, and radiograms was essential. Many of the transactions were directly concerned with the procurement of supplies necessary to the war effort. Delay in others might conceivably result in law-suits for the recovery of damages. In this field, the results were both negative—through denying information to the enemy; and positive—through enabling us to deny needed supplies to the enemy, oftentimes acquiring these same supplies for our own needs.

In its first days of operation, censorship intercepted a letter from a New York firm offering to sell to a foreign agency thirty-six hundred army field telephones. These telephones had been stored in a warehouse since World War I. Although declared surplus in 1918, the

field telephones were urgently needed in 1942. They went to the War Department, not to the foreign concern.

In the economic field, censorship helped to apply commercial pressure on Germany, to police the "freezing" of Axis credits and funds and to uncover supplies of quinine, tungsten and dozens of other critical materials. These positive contributions to economic warfare actually exceeded the entire cost of censorship during nearly four years of existence.

Despite the infrequency of communications between the Western Hemisphere and the Orient, censorship was able to produce vital economic information in the war against Japan. For example, an intercepted letter disclosed that a cargo of copper ore was going from a neutral nation to Japan. Purchase of this ore by the United States deprived the enemy of much-needed supplies, and added to our own stock piles. A considerable amount of information about conditions in Japanese occupied territory was gathered. Among other items there was found an account of petroleum works and power plants in Shanghai, the prices of consumer goods in other occupied Chinese cities, and an estimate of the capacity of cement mills which the Japanese were operating in China.

Frequent evasions of import and export regulations came to light through the activities of censorship. The Board of Economic Warfare called intercepted communications the "eyes, ears and tentacles" of export control. At one time, the Foreign Economic Administration estimated that 60 per cent of all export violations were uncovered by the censors. The Foreign Economic Administration wrote more than ten thousand warning letters on the basis of intercepts.

Economic Warfare

Both the Board of Economic Warfare and the Foreign Economic Administration were concerned with applying economic

pressure on the Axis nations and in securing information on which further action could be based. About thirty thousand items of information were obtained each week by the Foreign Economic Administration from censorship intercepts and other confidential sources. Statements such as: "Hedwig is being trained to make parts for airplane motors;" "We have been burning wood because coal is available only for factories;" "Our plant is now working twenty-four hours a day;" "The potato crop is unusually good;" "The old family cow has been killed for food;" "Sixty-year-old Uncle Heinrich was wounded at Stalingrad;" "By careful saving a cake can be made for Christmas" were bits of the jig-saw puzzle which had to be pieced together to demonstrate conditions within Germany.

Packages of pumpernickel sent to German prisoners of war by their families were tested to determine the quality of the grain; the tinfoil wrappings were found to be of remarkably fine materials. The hard sausages which invariably accompanied the pumpernickel, on the other hand, were made largely of substitutes, as was the soap sometimes tucked in a corner of the package. Even the ink used for addressing the parcels was of low grade.

In its battle to keep Germany from getting a sufficient supply of chrome, Foreign Economic Administration learned from censorship that the Nazis' stock was really short. One intercept reported that German industrialists were frantically trying to trace two missing railroad cars of chrome, an indication that even a comparatively small amount was vital.

Altogether there were dozens of uses for the material obtained through censorship intercepts. Sometimes the lives of parachutists and commando units were dependent upon information supplied by the censors. Psychological Warfare developed lines of attack from items illustrative

of the morale of the German population.

Simple scraps of information often led to important discoveries. "Why would they build a railroad to that town?," puzzled a translator as she read a letter from Germany to a prisoner of war in the United States. "I knew it well. It used to be only a farming community. It would not need a railroad." It was obvious that the Nazis would not build a spur railroad to a neighborhood of so little importance unless some new development was taking place which had a bearing on the war effort.

The information thus obtained was passed along to Military Intelligence. Investigations were made which resulted in a bombing raid that destroyed not only the railroad but the underground V-2 factory it was designed to serve.

A Swiss woman wrote that during a visit to Germany her train had been rerouted, and she was surprised to find herself in S—— where a stop was made for lunch.

By itself the statement was unimportant. But intelligence had been searching vainly for the rail junction where German railroad equipment was being concentrated after bombings had torn up the main lines. A look at the map showed that S—— was a logical center. When the bombing mission arrived, the yards were packed with freight cars. Attacks on such targets paid great dividends, since Germany had expanded armament production at the expense of rail equipment.

"Heavy defenses are being installed in the Haagsche Bosche," read a letter from a man in the capital of occupied Holland to a relative in America a few months before the Allies invaded Europe. The information was passed on. Months later censorship learned the sequel in another letter from the Hague: "The bombers came over last night. . . The Haagsche Bosche has disappeared completely."

Means to an End

Censorship is only a means to an end,

never the end itself. Censorship can provide information and source material for intelligence. At that point, censorship responsibility ends. It cannot pursue its discoveries. It is a reporting, not an investigative, agency.

In order to exploit the information available from censorship, close and detailed coordination is necessary with the agencies and departments who are able to act. Intelligence must furnish to censorship information concerning the types of material it is desired to suppress, lists of individuals and addresses under suspicion, and questions concerning the facts it is desired to establish regarding the enemy nation. Without this guidance, censorship is groping in the dark. For an efficient employment of the source a direction must be indicated.

Perhaps the most difficult problem facing censorship is that of stopping communications from enemy agents within the country. During the past war, the problem was approached through a conference of American, British and Canadian intelligence agencies and American, British and Canadian censors. An exchange of information concerning the identity and backgrounds of known and suspected enemy agents, their contacts, characteristics and their probable channels of communications enabled censorship to direct its activities toward intercepting communications intended for the eyes of the enemy.

A "watchlist" was compiled of known or suspected subversive persons and agents. In time, through the addition of supplemental names, this list contained 40,000 names. All communications passing through censorship were checked against the "watchlist." Those communications connected in any way with the list were given special attention.

A division of censorship was established and the responsibility assigned of uncovering the activities of enemy agents. A small staff of experts was collected to

perform analyses of codes and ciphers and to search for secret inks or other methods of concealing a message. This small staff directed the search of the postal and cable censors for communications bearing messages in invisible ink, cipher or open code.

International Cooperation

Censorship was international in application. All of the Western Allies during World War II exchanged comment sheets and the names of persons on the individual country's watchlists. At times, the results of this cooperation were startling.

During the winter of 1942-43, a certain individual, employed by the German Armistice Commission in Africa as a geologist, wrote a letter to a university in a neutral country. His letter was transmitted through Casablanca where the Theater censor was then carrying out 100 per cent censorship of mail for neutral countries. The letter was included in a lot of many hundreds turned over to the censor by the French.

The censor read the letter without too much interest. It appeared to be a complicated report of the geologist's professional activities and a request for technical advice and information. It appeared harmless, but the examiner had extracts made which, with the comment sheet, were forwarded to Allied Force Headquarters in Algiers.

At AFHQ the casual attitude changed. Priority Secret Cables were sent to the War Department and to the British War Office. Stripped of scientific terms, the letter indicated that the writer believed he had located uranium deposits. The technical advice and information he requested was for the method of constructing a uranium pile.

This was the first positive indication that the Germans were engaged in atomic research, and the extent of their experimental development. This knowledge served to spur our own researchers. Fortunately, we won the race.

Air Industrial Preparedness

Rear Admiral Thomas S. Combs, USN
Deputy Chief, Bureau of Aeronautics, Department of the Navy*

INDUSTRIAL preparedness or industrial mobilization planning has received considerable public attention, particularly over the past several years. Although this subject has been in the public eye lately the idea is not new, for it has long been a major issue in the minds of the country's ablest leaders and planners. World War II clearly demonstrated that wars are no longer conflicts between armies and fleets, but are contests between nation's economies—total resources against total resources—battles of production.

In the industrial era of today the heart of a nation's economy is its industrial potential, and it follows that a nation's war potential is directly measured by its industrial structure and development. The most important factor, besides having an available industrial economy and an abundance of material resources, is the ability to adapt rapidly and to utilize fully the country's industrial capacity for production of war matériel. This can only be accomplished by careful, comprehensive, continuous, realistic planning.

* Printed by arrangement with *The Pegasus*, Fairchild Engine and Airplane Corporation.

National Planning

Military planning can no longer be confined strictly to military matters; it now necessarily encompasses the development of plans to include the entire national economy. The emphasis placed on industrial preparedness, brought home by the lessons learned in the recent war, and the present troublesome conditions existing in the world today, have placed a high priority on national industrial mobilization planning. In keeping with this national policy, the Department of the Navy endorses, and is actively pursuing, a course that will develop its industrial preparedness program into a form suitable for incorporation into the National Industrial Mobilization Plan of the Munitions Board. The Assistant Secretary of the Navy has therefore directed that each bureau and office of the Department of the Navy establish within its respective organization a competent planning unit capable of developing the data necessary for the formulation of such a plan. The purpose of this article is to outline the effort now being made by the Bureau of Aeronautics in the field of industrial mobilization and its sister field, procurement coordination planning.

To meet the challenge of modern war and its battles of production, the Navy is developing an Industrial Mobilization Plan to determine the industrial support that is necessary for its aircraft requirements

In the past two wars, although our training and equipping of men lagged seriously behind the requirements of our military leaders' strategic plans, we did not suffer as a result of these delays because our allies held the enemy in check. If, however, the United States should be the initial target of aggression in a future war, and this should be our assumption, the ability to produce munitions in quantity in minimum time is necessary to implement the strategic plans for the defense of the country. If we fail to do this the alternative can be defeat. To be secure we must be ready!

Achieving Air Security

The problems involved in achieving national security, in so far as aircraft is concerned, can be resolved in two ways—a high level of production which would maintain the country in a perpetual state of full preparedness for war, or a lower level of production with carefully thought out plans to move from this level to a war level with maximum rapidity. The first course is obviously one that this country could not afford, and is therefore impractical. The second course, by simple deduction, is the realistic approach, and one that will be further developed in this article.

A study of the large problem of industrial mobilization begins with specific month-by-month production requirements for aircraft by designated models called for in a future M-day to meet the strategic plan for the defense of the country. These strategic requirements establish the criteria by which the industry's ability to expand production can be judged and constitute the objective of all industrial mobilization planning. The magnitude and complexity of this objective is understood when one considers that total war will touch every corner of the nation's economy.

Steps Required

After requirements have been set, the approach to this problem of "where we are and where must we go" divides itself logically into four main steps, or areas of activity:

1. Analysis to determine the most desirable pattern of preparedness measures for high production.
2. Determination of industry capabilities—and deficiencies.
3. Procurement of specific preparedness measures to overcome specific critical bottlenecks.
4. Continuation of high production preparedness measures already adopted.

Let us amplify these four general statements. In Step 1, an analysis must be made to determine what preparedness measures, costing how much, and saving how much time in an emergency, might be adopted in peacetime for each of the many industries which are now, or in an emergency would be, engaged in the production of air matériel. This analysis, part of which may be accomplished under government contract, has been, or is being, made by industry itself with full government coordination and establishes the most practicable pattern for preparedness measures within industry. This work has resulted in certain studies which are generally referred to in aircraft industrial planning as "Phase I" studies. These studies, as already indicated, contain industry's best thinking on what to do, how much it will cost, and how much time will be saved to attain maximum expansibility of production. Twenty-nine such industrial analyses have been obtained by the Bureau of Aeronautics-Air Force team from representative aircraft and aircraft component producers and are now available.

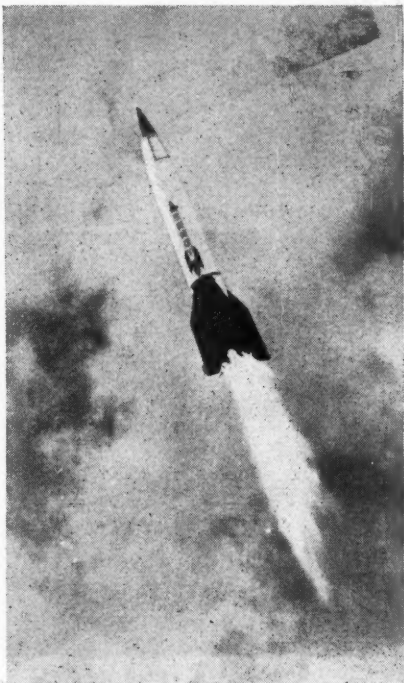
In Step 2, studies by industry to determine the probable mobilization output of air matériel end items and the added production resources which would be re-

quired to sustain this emergency high volume production are now in process of preparation. These are known as "Phase II" studies. Data contained therein, based on specific mobilization items, will provide a sound foundation for industrial planning. It will establish the relationship between mobilization requirements schedules and industry's capability to meet these requirements. It will locate bottlenecks in supply and component fields which demand pre-emergency preparedness. No more space will be devoted to these Phase II studies, except to state that the designated mobilization items stem from the Joint Chiefs of Staff preliminary, over-all requirements.

The manufacturers, therefore, are developing emergency manufacturing schedules for these selected items based on estimated production goals as derived from the over-all requirements. In addition to preparing the emergency schedules, the manufacturer will provide a manufacturing plan to justify his schedules and will compute the resources necessary to support his program. That portion of the requirements beyond his capacity will constitute an additional requirement which industries other than the aircraft industry will be asked to absorb. By way of illustration, the aircraft industry in World War II produced only 40 per cent of engine requirements—the automobile industry the other 60 per cent.

Step 3 indicates that procurement of specific preparedness measures from the aircraft and allied industries, beginning in the most critical fields, is necessary. A great variety of possible direct preparedness measures must be considered, such as revising the manufacturers' peacetime technology to incorporate high production designs and plans, tool design, plant lay-out, plans and contingent arrangements with potential licensees and sub-contractors, actual licensing during peacetime, and small production contracts

for educational purposes. By way of example here, the different technology practiced in manufacturing drawings in the aircraft industry as compared to the automotive industry occasioned numerous delays during the last war in converting the latter to the manufacturing of aeronautical articles.



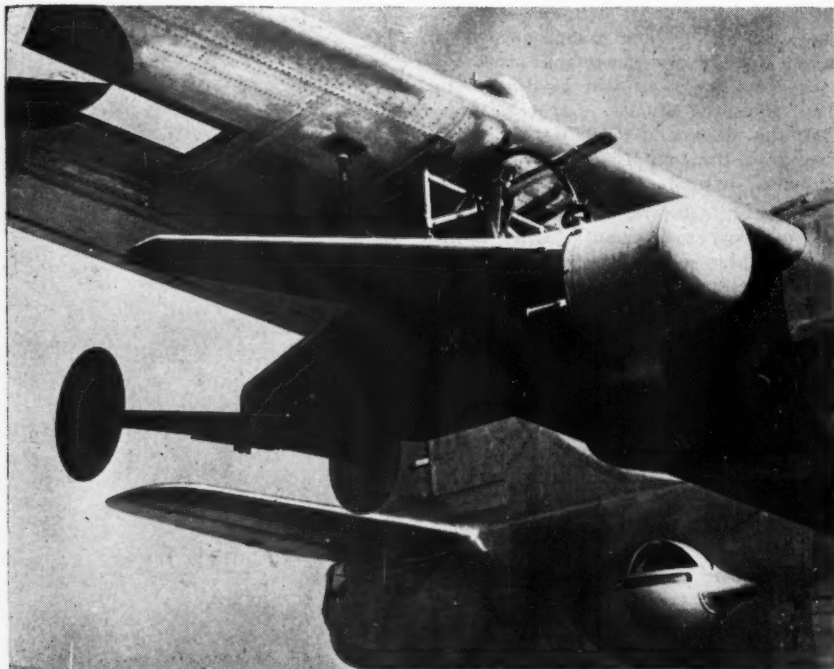
V-2 rocket in flight after being fired from Carrier *Midway*.—US Navy photo.

Step 4 states that whatever preparedness measures for high production are adopted in any one year must be continuously maintained during the active life of the mobilization article. As design changes and improvements are incorporated into aircraft production, it will be

necessary to revise preparedness plans and data, which otherwise would become obsolete, to maintain up-to-date mobilization models.

This is no more than a general outline of the approach to the present problem, as such a program cannot be completed in any one year; rather it will require

vide matériel to meet mobilization requirements. Therefore the Bureau of Aeronautics' task is to develop an Industrial Mobilization Plan. This plan, fully coordinated with the Army, the Air Force, the Navy and industry, when completed, will become a part of the Navy Basic Mobilization Plan covering the industrial



The Navy's radar-guided "Bat" bomb, used against Japanese shipping, was carried under the wings of "Privateer" patrol planes.—US Navy photo.

continual and energetic effort in all its specific phases.

Bureau of Aeronautics

The responsibility of the Bureau of Aeronautics in the field of industrial mobilization and procurement coordination planning is clear and fixed. It must pro-

vide support necessary to meet the Navy's aircraft requirements.

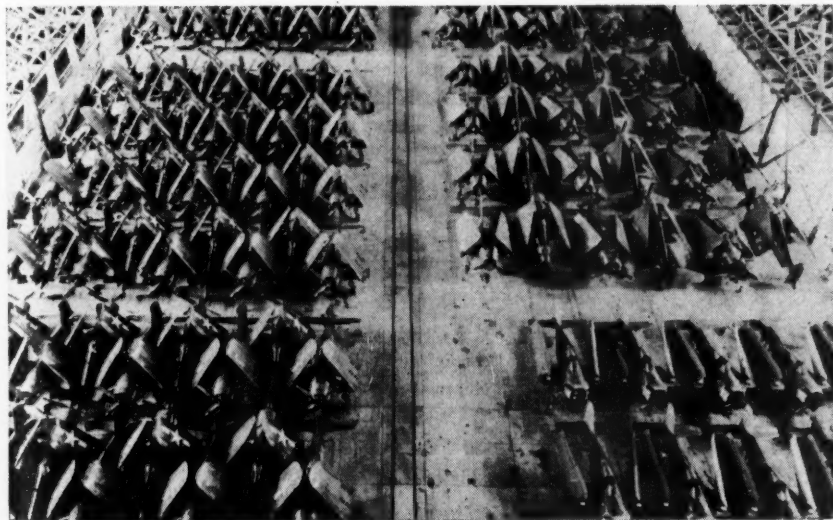
Now what is the Bureau of Aeronautics doing about it? In accordance with the Assistant Secretary of the Navy's directive that each bureau and office establish a competent planning unit, an Industrial Planning Branch has been established in

the Procurement Division of the Bureau of Aeronautics. This branch is responsible for the formulation and maintenance of the Bureau of Aeronautics industrial mobilization plans in a form suitable for incorporation into a national plan. It is so organized and operated as to provide a nucleus which will be readily expandable to meet the increased demands of war.

Air Industry Studies

In coordination with the Department of

to utilize plentiful sources of labor, power and transportation. It is actively acquiring, at no cost, from surplus stocks, machine tools essential to the industrial mobilization plan. These two programs will constitute an Industrial Reserve ready to be put into almost immediate use for essential production should another emergency occur. The bureau supports an integrated program consisting of Air Force, Navy, and civilian industrial plan-



Navy planes awaiting long-term storage process.—US Navy photo.

the Air Force, the aircraft industry has been requested to study production records and submit their ideas as to "what preparedness measures," "costing how much" will save "how much time." The objective of the Bureau of Aeronautics is to buy on an annual basis, within the limits of our funds, the most expert, effective recommendations available on this subject. The bureau also has its standby plant program, consisting of five selected, widely dispersed plants situated so as

ning committees, to assure maximum coordination in this field, and which within the Department of the Navy will be channeled to the field through the Bureau of Aeronautics General Representatives, of the Eastern, Central and Western Districts, and the Aviation Supply Office.

That's the progress report to date. Now, how do we carry this program forward? Here is the answer. The Assistant Secretary of the Navy has requested that bureaus and offices, in the preparation

of their budgets, submit their estimates for industrial planning annually, as a separate item. These funds will provide the means to operate a continuous preparedness plan and will permit the Bureau of Aeronautics to devote currently its energy toward fulfillment of the basic principles heretofore presented.

All of us are familiar with the value of combined military maneuvers. They are essential for training and for preparing an alert, coordinated force to be ready for combat. Combining this with industrial preparedness planning, we are investing in a life insurance policy for national security!

A strong United States means a stable world. . . . Our strength must take the form not only of an adequate Army, Navy, and Air Force but of adequate industrial preparedness as well.

Secretary of Defense James V. Forrestal

It is no detraction from the heroic deeds and sacrifices of our fighting men to state that American industrial power was the greatest single factor in the victories of World War II. Without this overwhelming material force, the sacrifices of our men would have been immeasurably greater and the conflict would have been inevitably prolonged.

Secretary of the Army Kenneth C. Royall

The elementary forms of war evolve with matériel. The war of matériel will improve in quality, variety, and potency, and to this we must adjust our tactical and operational doctrines.

General Lopez Valencia, Spain

Administrative Management

Lieutenant Colonel E. B. Bissell, *Infantry*
Instructor, Command and General Staff College

WITH the accelerated influx into military parlance of old words with new meanings and of new words with old meanings, an old word is creeping in with a befuddled meaning. Before this word, management, has crept too far and cast a haze over the position of the commander and his principal assistants, it is well that we analyze the word and establish its significance. Management in the minds of many has come to be synonymous with control. We might just as reasonably define an automobile as a steering gear, for control is only one of the elements of management.

Dictionaries define management as the well-advised executive superintendence of an enterprise by skillfully employing the means available to accomplish a purpose. And after reading that definition we still ask: What is management? Twenty-odd years ago M. Henri Fayol, an eminent French specialist on administrative management, said that the functions of management are three: "to plan and organize; to command and coordinate; and to watch results." Here, then, is a good starting point for our analysis.

To Plan and Organize

Quite logically the initial impetus of

a successful enterprise is a well-conceived plan—one based on a logical estimate of the situation; one which has the long range objective clearly in view. As necessary supplements to the projected long term plan are the short range schemes all aimed directly at the final target. With the long range plan well in view, changes in the right direction can be made in more imminent undertakings without fear of rambling off along divergent tangents. Without a sharp and distinct long range target, numerous false starts are unavoidable, and alterations can be predicated only on a basis of expediency to resolve the problem immediately at hand.

To implement properly a system of plans, the next task of management is to organize the tools or means so that they can be skillfully employed to accomplish the mission. Whether it be an assembly line to build a mouse trap or an involved administrative organization to support a theater of operations, the task of organizing is simply that of dividing the responsibilities to get the job done. It has been propounded that a dynamic personality or an outstanding leader can make any organization work; but since these two species are rather rare, and the

The functions of management are "to plan and organize; to command and coordinate; and to watch results." Here is a discussion of how these principles apply to the duties of the military commander and his staff

premise itself is doubtful, let us analyze an organization framework that an individual of average ability can operate.

In the first place, each function and responsibility with which the organization is charged must be clear-cut and thoroughly understood, and must be properly assigned to a single agency. Each individual and unit must understand not only their positions, but also the whole structure in order to avoid duplication of effort, friction and working at cross purposes. Overlapping and duplication of effort are not only uneconomical, but they lead directly to confusion and inefficiency. Simplicity and flexibility are next in line as minimum essentials. Without them the manager will find that minor changes in missions or plans will frequently demand prerequisite reshuffles of the whole operational framework. Simplicity of organization naturally leads to several musts: each member of the organization must have only one boss, and there must never be a doubt about to whom he reports or who reports to him. If the superstructure of the organization is not simple and clear, then bewilderment and confusion are reflected all the way down.

If there is one byword in the art of simplifying and clarifying organization, it is decentralization. Decentralize in order to avoid strangulation by an endless flood of paperwork; decentralize so that men on the ground, men who have an intimate working knowledge of the situation, can make the day to day decisions. Decentralize in order that the top executive will have the freedom to plan and visualize without having the panorama obscured by a fog of operational details.

In this division and distribution of responsibility, the manager must by all means, decentralize the authority to match the responsibility. When authority, responsibility and means are decentralized, however, a constant guard must be maintained to keep staff units from nullify-

ing the advantage gained by violating the command chain. Closely knit working relationships of the staff with coordinate and subordinate commands must be cultivated, but the authoritative position of each commander must never be jeopardized. Finally, after the organization can meet the standards of framework outlined above, there is one test to apply to determine whether it can be effectively controlled by the commander: Has the principle of span of control been violated? Has one supervisor been charged with superintending more than he is physically capable of doing? Not more than seven members of an administrative structure can be supervised by one individual; not more than twelve, if the supervisor's grasp has been extended by the addition of a deputy, executive, or chief of staff.

To Command and Coordinate

Given the Utopian organization envisioned above, management's next task is directing and harmonizing. If each individual were perfectly qualified for his position and had the best intentions, commanding and coordinating would still be an enormous problem. The top manager, as well as his staff and operators, must continuously inventory his problems, their relative importance, the progress made, and the work remaining. And in so doing he must free himself from the constant siege of the day to day minutiae of operations in order to remain fully cognizant of all his tasks and their relative importance. Only by freeing themselves of the details of administrative burdens can the commander and his coordinating staff maintain intimate contact with their operators and observe first hand what the organization is doing. There is no substitute for this direct touch in refreshing the management's point of view, in keeping it realistic, in observing needs and deficiencies and

in stimulating both top management and the operating agencies.

And to Watch Results

Finally with the enterprise planned and organized, and with the means properly directed and coordinated, there remains for the executive one last vital task to complete his management function—that of actively watching results. For the small enterprise, that duty can be discharged by the commander personally keeping his fingers on the pulse of the operations. However, as the job grows, the manager or commander must install an extension on his mind—an executive, a deputy, a chief of staff or a small force devoted entirely to helping him perform his responsibilities of following through. The function of such a force is commonly called "control;" however a control office does not operate in accordance with the dictionary definition, that is, to check or regulate, rule, dominate, or restrain. To the contrary, control increases the efficiency of command by measuring progress, by comparing and criticizing, by stimulating planning, by simplifying and

strengthening organization, and by facilitating coordination.

Control broadens the grasp of the manager by solving for him problems relative to organization, procedures, records and reports, and utilization of manpower. In its role as a fact finder and trouble shooter, a control office incidentally stimulates and rouses the operator level to more active self analysis and improvement. Control is management's gauge for assuring that operations are carried out in accord with principles, plans, and orders; it is a regulator to insure that methods, systems and routines keep pace with, but do not impede, primary functions; and it is the eye which scrutinizes the enterprise for undue influence of patterns, precedents and traditions.

In no single phase of an enterprise, then, does administrative management find a seclusive niche; instead, it superintends by organizing means to execute a plan, by deputizing subordinates to command the means, and by supervising closely the accomplishment of the purpose.

The Army personnel policy is predicated on the premise that the individual is the most important single asset in any army. It aims to clarify and improve the daily working relationships between each individual and unit by fully recognizing the dignity and importance of the individual so that the Army may operate as an integrated team in the National Military Establishment. Army personnel management aims to maintain an organization efficiently administered and effectively managed.

Department of the Army, Circular No. 121, 30 April 1948

Employment of Armor in the Invasion of Oran

Lieutenant Colonel Bogardus S. Cairns, *Cavalry*

The following article is one of the monographs prepared by officers attending the 1946-1947 class of the Command and General Staff College.—The Editor.

Introduction

AMERICAN armor was first used on a large scale in World War II in Operation Torch. This operation, which took place in November 1942, was the simultaneous invasion of North Africa at three widely separated points. The Eastern Task Force, predominantly British, landed at Algiers. The Western Task Force, entirely American, staged out of the United States and landed in Morocco with Casablanca as its main objective. The Center Task Force, which had as its mission the capture of Oran, consisted of the American II Corps supported by British Naval Forces, including carrier-based aircraft, and the American 12th Air Force. The major ground combat elements of this force were the 1st Infantry Division and Combat Command "B" 1st Armored Division.

Terrain

Oran lies in the western part of Algeria, French North Africa. The coastline in the area is extremely rocky with many

high cliffs except at the several beaches. Arzew Beach, twenty-five miles east of Oran, is the largest and by far the most suitable landing beach in the area. The other beaches used in this operation were at Les Andalouses and Mersa-bou-Zedjar, fifteen and thirty miles to the west respectively.

Southwest of and dominating the bay as well as the city of Oran is a large hill mass, the highest part of which is the Djebel Murdjadjo. South of this hill mass is the Sebkhah of Oran, a large saline depression which is passable for vehicles when dry but extremely boggy when wet. The Sebkhah lies in a wide plain which runs southwest from the Gulf of Arzew. This entire plain, with the exception of the Sebkhah and several marshy areas just south and southwest of the Gulf of Arzew, proved very satisfactory for the maneuver of armored vehicles during the operation.

South of the plain are the rugged Mountains of Tessala separating the Oran area from the plain of Bel Abbes in which lies Sidi-Bel-Abbes, famous as the home of the French Foreign Legion.

Rivers and streams in the area have rocky bottoms and steep banks; crossings, however, can be found at irregular in-

Although at Oran, North Africa, American armor was being used on a large scale for the first time in World War II, its employment was sound, full use being made of its characteristic mobility and speed

tervals. The streams are generally dry except near their mouths, but a few days of rain will make even small streams impassable for fording.

The highway net in the plain south of Oran and east to Arzew is adequate.

The road running southwest of Oran to Lourmel goes through a defile between the Sebkha and the Djebel Murdjadjo. There is one coast road west from Oran to Les Andalouses but there are many defiles on it along the coast, and it can be easily blocked. This same road is the only one running across the mountains from Les Andalouses to Lourmel.

Railroads in this area are very poor, and are both standard and narrow gauge.

Airfields are located at La Senia and Tafaraoui with small emergency fields at Lourmel and Oggaz.

lized by the attacks of the Eastern and Western Task Forces at Algiers and Casablanca.

French Navy units manned the coastal defenses of Oran and Arzew. Oran was defended by forty-five coast defense guns of calibers ranging from 3 to 9.4 inches. There were also six guns at Arzew. Many of these guns were sited with all-around traverse so that they could be used inland.

French Air Forces located at La Senia and Tafaraoui airfields consisted of fighters, bombers, torpedo bombers, and reconnaissance planes totaling about 100 in all.

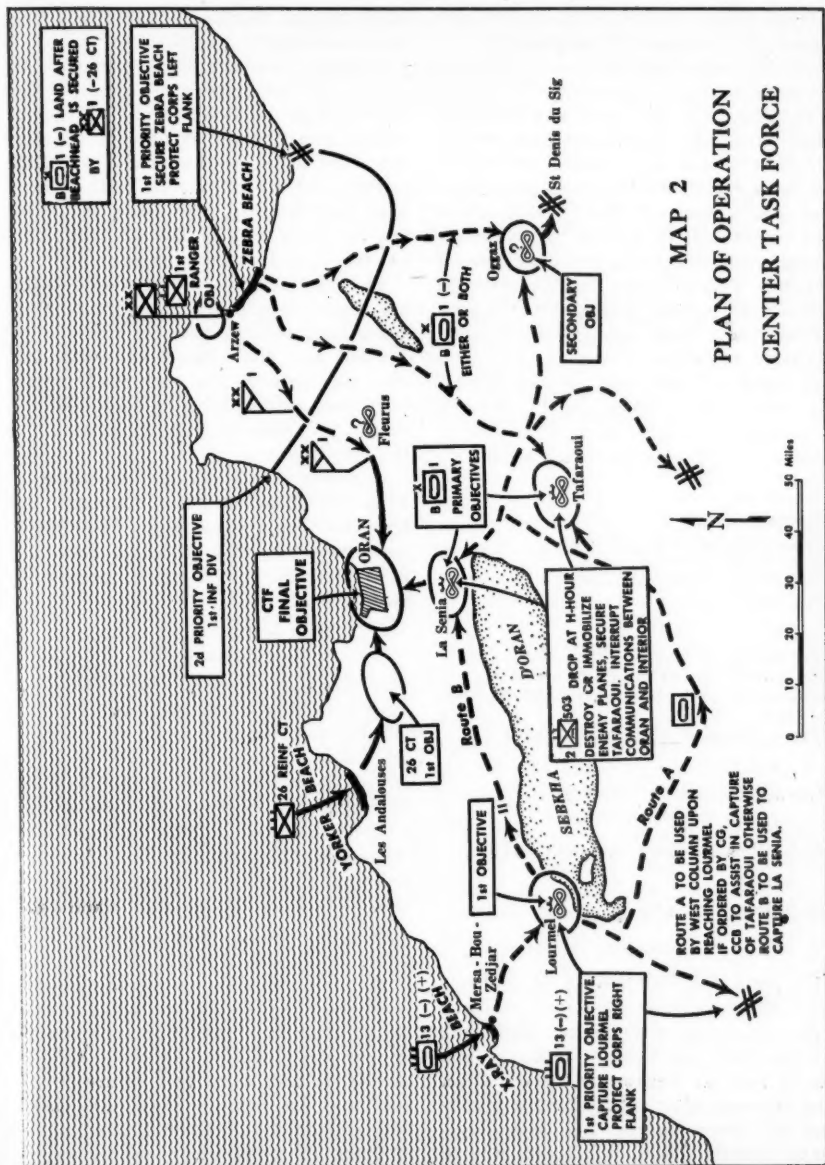
The estimate of the mobile troops of the Oran Division, all of which were from 15 per cent to 20 per cent understrength, was as follows:

Number	Type	Armament	Strength
11	Infantry Battalions	Infantry weapons	9,000
1	Mechanized Cavalry Regiment	Two tank troops, each with twenty medium and/or light tanks possibly supplemented by armored cars; one reconnaissance troop of approximately twenty armored cars	2,000
2	Motorized Cavalry Squadrons		
2	Horse Cavalry Squadrons	Cavalry weapons	
14	Field Artillery Batteries	75-mm guns except three batteries possibly equipped with 105-mm and 155-mm guns	3,000
8	Antiaircraft Artillery Batteries	Each battery four guns, 75-mm, and three machine guns varying from 13.2-mm to 20-mm	
	Miscellaneous	Service Units and others	2,200
		Total Strength Oran Division about	16,200

Enemy Situation (Map 1)

Forces in the Oran area were part of the Oran Division. West of the division was the Fes (Moroccan) Division and to the east was the Algerian Division. Troops of the Fes and Algerian Divisions did not affect the operations at Oran because they were kept busy or immobi-

lized by the attacks of the Eastern and Western Task Forces at Algiers and Casablanca. French Navy units manned the coastal defenses of Oran and Arzew. Oran was defended by forty-five coast defense guns of calibers ranging from 3 to 9.4 inches. There were also six guns at Arzew. Many of these guns were sited with all-around traverse so that they could be used inland. French Air Forces located at La Senia and Tafaraoui airfields consisted of fighters, bombers, torpedo bombers, and reconnaissance planes totaling about 100 in all. The estimate of the mobile troops of the Oran Division, all of which were from 15 per cent to 20 per cent understrength, was as follows:



fighting troops, but was likewise handicapped by shortages of equipment.

All units were short of organic vehicles. There had been no replacements of vehicles since 1939, and the Axis had curtailed spare parts and material to such an extent that proper maintenance and repair had been impossible. The gasoline allowance was almost nil. Many vehicles had been converted to alcohol or charcoal-burning motors with a resulting loss of efficiency. This situation, together with the difficulty of moving troops over the poor railroad net, made the Oran Division relatively immobile.

In spite of this lack of mobility it was considered possible for the French to concentrate the following troops in defense of Oran by the times indicated:

D-day

- 5 Battalions Infantry
- 1 Regiment Cavalry (Mecz)
- 2 Squadrons Cavalry (Mtz)
- 5 Battalions Field Artillery
- 1 Regiment AAA

D+1

- 5 Battalions Infantry (Oran Div)
- 4 Battalions Infantry (Fes Div)
- 3 Batteries Field Artillery (Mtz) (Fes Div)
- 1 Troop Cavalry (Mtz) (Fes Div)

D+3

- 1 Cavalry Squadron (Horse)

D+4

- 3 Battalions Infantry (Algiers Div)

D+5

- 5 Battalions Infantry (Fes Div)

Plan of Operation, II Corps

The plan for the capture of Oran is shown graphically on Map 2.

The 1st Infantry Division, reinforced, less the 26th Regimental Combat Team, was to land at Arzew and attack Oran from the east after establishing a beachhead at Arzew beach. The 26th Regimental Combat Team, reinforced, was to land at Les Andalouses, secure the heights

of the Djebel Murdjadjo, and attack Oran from the west.

Combat Command "B", 1st Armored Division, divided into two armored task forces, was to swing wide of the infantry attack, block avenues of approach from the south, southwest and southeast, capture the airfields at La Senia, Tafaroui, and Lourmel, and assist the infantry in the capture of Oran by an attack on the city from the south.

The 3d Battalion, 6th Armored Infantry, was to invade Oran from the north by sea assault, landing from the cutters *HMS Walney* and *HMS Hartland*. Their mission was to seize the port facilities and hold them until relieved by other invading forces in order to prevent sabotage of the installations.

Airborne assault by the 2d Battalion, 503d Parachute Infantry Regiment, was also included in the plan. This battalion was to drop on the two main airfields and hold them until relieved by the armor.

Plan of Operation, Combat Command "B"

As Combat Command "B" (CCB) was to be operating on its own away from the division for several months, the staffs of the Combat Command and the 13th Armored Regiment were combined into one operating staff in order to control and administer the troops of the command more efficiently. This combined staff worked so well that it remained intact for the balance of the North African Campaign.

For the initial phases of the operation, CCB was divided into two task forces, (TF) Red and Green, as shown on page 51. TF Red was to land at Arzew Beach after the beach had been secured by the 1st Infantry Division, advance rapidly inland, seize and secure Tafaroui and La Senia airfields and assist the 1st Infantry Division in the capture of Oran. TF green was to secure its own beachhead at Mersa-bou-Zedjar, advance

TASK ORGANIZATION COMBAT COMMAND "B," 1st ARMORED DIVISION OPERATION TORCH

Task Force Red

Brig Gen Lunsford E. Oliver.
Commanding

Hq & Hq Co, CCB
1st Bn, 1st Arm'd Regt
2d Bn, 13th Arm'd Regt
2d Bn, 6th Arm'd Inf Regt
27th Arm'd FA Bn (—Btry C)
106th CAC Bn (AA) (—Btry D)
Co B, 701st TD Bn
2d Bn, 591st Engr Boat Regt (—Co E)
Rcn Co, 13th Arm'd Regt (—Plat)
Co B, 16th Arm'd Engr Bn
Det, Co E, 16th Arm'd Engr Bn
Det, 141st Arm'd Sig Co
Co B, 47th Arm'd Med Bn (—Det)
Co B, 1st Arm'd Sup Bn
Co B, 1st Arm'd Maint Bn
Sv Co, 13th Arm'd Regt (—Det)
Maint Co, 13th Arm'd Regt (—Det)

Task Force Green

Col Paul M. Robinett,
Commanding

Hq & Hq Co, 13th Arm'd Regt
1st Bn, 13th Arm'd Regt
1st Bn, 6th Arm'd Inf Regt
Btry C, 27th Arm'd FA Bn
Btry D, 106th CAC Bn (AA)
Co C, 701st TD Bn
Co E, 591st Engr Boat Regt
Plat, Rcn Co, 13th Arm'd Regt
Det, Sv Co, 13th Arm'd Regt
—Det, Maint Co, 13th Arm'd Regt
Co A, 16th Arm'd Engr Bn
Det, Co B, 47th Arm'd Med Bn
Det, 141st Arm'd Sig Co

rapidly to the east, capture the airfields at Lourmel, assist TF Red in the capture of Tafaraoui and La Senia airfields, and protect the west flank of Center Task Force.

The plan to carry out CCB's mission was to have the reconnaissance elements of each force land first and proceed inland at once to the initial objectives. Following the reconnaissance elements of each force was a light armored column called the Flying Column. This was to move out as soon as it could unload and get organized. The Flying Column of each force consisted of a light tank company, an armored infantry company, an armored engineer platoon and a tank destroyer platoon. The mission of the two Flying Columns was to advance rapidly inland, by-passing resistance, to seize and secure each of the Combat Command objectives until relieved by other forces.

In order to expedite the landings of the Flying Columns, CCB was allocated three "maracaibos." These were shallow draft, flatbottomed, seagoing ships which had been converted by the British to

carry tanks. They had a gate in their bows and telescoping ramps. Essentially they were crude fore-runners of our present LSTs (Landing Ship, Tank). When the British converted these ships they rated their capacity very conservatively. In order to make the Flying Columns as strong as possible it was necessary to load the "maracaibos" to their maximum capacity. This later proved extremely fortunate, as few vehicles, other than those loaded on the "maracaibos," got ashore in time to participate in the operation. As TF Green was only about one-half the size of TF Red, one of the "maracaibos" was allotted to it and the other two went to TF Red.

Center Task Force issued instructions that there would be no firing unless the French opened fire first, because it was hoped that the French would not resist and that the whole invasion could be accomplished without bloodshed. Consequently no preliminary bombardment of the beaches was planned.

The Invasion

Zero hour for the landing was 0100,

8 November 1942. The assault waves of TF Green at Mersa-bou-Zedjar were delayed, because a French convoy moving east along the coast passed between the assault anchorage and the beach. When this convoy had passed, the assault waves continued on into the beach and landed at 0143 without opposition. By 0346 the 1st Battalion, 6th Armored Infantry, had secured the headlands and high ground surrounding the beach and had reported the entire beachhead area clear except for a French corporal and his squad who were found in the town. They promptly welcomed the Americans to Africa and set to work helping unload the landing craft as they hit the beach. At 0400, the Bachaquero, the "maracaibo" carrying the Green Flying Column, hit a sandbar some distance from the beach and it became necessary for the engineers to construct a treadway bridge from the ship to the beach before unloading could begin. This was finally completed, and at 0700 the Flying Column started unloading and moving into its assembly area for de-waterproofing.

In the meantime, the Reconnaissance Platoon had been unloaded under difficulty. The beach had proved to be very soft, requiring Summerfelt track and dozers to construct the beach exits. The platoon finally moved out at 0605 toward its first objective, Lourmel.

At 0900, just as the Flying Column started for Lourmel, the Reconnaissance Platoon reported that it had been fired on by a French armored car just east of Lourmel and that the armored car had withdrawn toward Bou-Tielis. The platoon was ordered to hold Lourmel until relieved by the Flying Column, and then to proceed to the south and establish a road block in the vicinity of Rio Salado to prevent enemy movement toward Lourmel from that direction.

By 1130 the Flying Column had occupied Lourmel and had sent the 2d

Platoon, Company A, 16th Armored Engineer Battalion, to assist the Reconnaissance Platoon in maintaining the road block at Rio Salado.

At noon word was received from TF Red that the Red Flying Column had captured Tafaraoui airport and that the new objective of TF Green was the capture of La Senia.

Leaving Company B, 6th Armored Infantry, less the 2d Platoon, to garrison Lourmel, the Green Flying Column moved out on the road to La Senia. One mile west of Bou-Tielis they ran into stubborn resistance by armored cars and antitank guns. The column overcame this road-block and another one at Bredea and then continued on toward Misserghin where it was forced to by-pass some very determined resistance. It then bivouacked for the night in the Sebkhia. Shortly after the fight at Bredea, radio contact was lost between the Flying Column and Headquarters, TF Green, which by this time had moved to Lourmel. No contact of any kind was again made until late the next afternoon.

At 1800 the infantry in Lourmel was sent to relieve the Reconnaissance Platoon at the road block in Rio Salado and the platoon ordered to extend its reconnaissance as far to the southwest as Ain Témouchent.

Headquarters, TF Green, then moved to the east with the additional combat vehicles which had been unloaded during the day. These consisted essentially of a light tank platoon, several command half-tracks, the reconnaissance platoons of the regiment and 1st Battalion, an assault gun platoon and a platoon of Battery C, 27th Armored Field Artillery Battalion. At 2100 this column bivouacked in the Sebkhia about two miles west of Bredea.

In the meantime, TF Red had beached its two "maracaibos" on Arzew Beach in the vicinity of St. Leu after the beach-



Les Andalouses beach, above, was one of three beaches used in the operation against Oran in North Africa. Below, tanks of the 13th Armored Regiment, 1st Armored Division, near Tafaraoui Airfield after the capture of Oran.—Army Signal Corps photos.



head had been secured by the 1st Infantry Division. By 0800 they were completely unloaded, and Reconnaissance Company, 13th Armored Regiment, less the platoon with TF Green, moved out on its mission toward St. Barbe-du-Tlelat, Tafaraoui, and St. Denis-du-Sig.

At 0835 the Red Flying Column moved out for Tafaraoui. The attack on the airport was launched at about 1100 and by 1215 it had been captured together with about 300 prisoners. French planes from La Senia bombed the field once during the afternoon but by 1630, the field was in shape and a squadron of Spitfires from Gibraltar had started using it.

Headquarters, Combat Command "B" went ashore at 0930 that morning and established its Command Post at St. Leu.

The night of 8-9 November was uneventful. The Green Flying Column had maneuvered into position to attack La Senia at dawn in a coordinated attack with the Red Flying Column. The attack was launched at 0745, and by 0840 the Green Flying Column had captured the airfield, taking 160 prisoners and some 3,000 gallons of gasoline. The Red Flying Column had started its move to La Senia at 0750, but was held up by artillery fire from Valmy and the hills northwest of Tafaraoui. At the same time the Reconnaissance Company reported a column of French tanks and artillery moving north at St. Lucien. Since there was no reserve available to meet this force, the Red Flying Column was forced to abandon its attack on La Senia and move to protect Tafaraoui from this threat from the south. One light tank company and a platoon of infantry was sent to by-pass the opposition at Valmy and reinforce the Green Flying Column at La Senia while the balance of the Red Flying Column attacked the French tanks at St. Lucien destroying fourteen of them.

The unloading of ships at Arzew was proceeding so slowly that it was some

time before any reserve was available to CCB. Finally a force of two medium tanks, five light tanks, and two tank destroyers were dispatched from St. Leu to Tafaraoui to reinforce the Flying Column there and to escort a resupply convoy of gasoline and ammunition.

In mid-afternoon of 9 November, the infantry battalion of the 16th Infantry, charged with protecting the Corps left flank, was having difficulty in the vicinity of La Macta. CCB sent an infantry company mounted in half-tracks, two platoons of light tanks and a section of tank destroyers to their assistance. This force attacked and advanced about five miles beyond the line held by the battalion and was relieved, except for one platoon of light tanks and the section of tank destroyers which remained with the battalion. The balance of the force returned to St. Leu.

TF Green, in the meantime, was having its difficulties. The Flying Column at La Senia was under frequent fire of the coast defense batteries in the vicinity of Oran and by two batteries of 75-mm guns at Valmy. At 1700 the fire from Valmy became too much to take so a platoon of light tanks and a platoon of infantry attacked Valmy and destroyed three enemy guns and drove the rest off to the east.

The main body of the Green Force, which had bivouacked near Bredea on the night of 8-9 November, moved out early on 9 November to join the Flying Column at La Senia and prepare to attack Oran. This column came to an abrupt halt when it ran into the strong force of infantry, artillery and antitank guns which the Flying Columns had by-passed at Misserghin. Three attacks were made on the town without success. Word was finally received from the Flying Column at La Senia that they were low on gasoline and ammunition and needed help. Reconnaissance was started immediately to locate

a route through the Sebkha to by-pass Misserghin. At 1800 the main body, which had grown in strength as additional vehicles were unloaded and sent forward from the beach, moved out to by-pass Misserghin to the south. At 0100, after seven hours of very slow progress through the treacherous Sebkha, the main body joined the Flying Column. By 0600 Company A, 6th Armored Infantry, Company B, 13th Armored Regiment, and the balance of Battery C, 27th Armored Field Artillery Battalion, and three trucks of gasoline and ammunition, arrived from the beach using the same route through the Sebkha. This brought TF Green up to sizable strength for the attack on Oran.

Also during the night, 2d Battalion, 6th Armored Infantry, moved from St. Leu to relieve the Red Flying Column at Tafaraoui to permit it to take part in the assault on Oran.

A coordinated attack on Oran by Red and Green forces was scheduled for 0730, 10 November. The Green Force was to by-pass the town of La Senia to the west, attack Oran and seize the port facilities. The Red Force was to attack Oran east of the Valmy—La Senia road and reduce any resistance holding up the 1st Infantry Division.

The Red column was held up for a short while by a road block north of the La Senia airport and by fire from artillery and antiaircraft guns near Valmy and Sidi Chami. This caused a delay in the attack which finally jumped off at 0930. By noon the Commanding General of the Oran Division had surrendered to the Green column commander and the Mayor of Oran had surrendered to the Red column. The cease firing order was given at 1215, 10 November.

Conclusions

1. The plan for the employment of armor in this situation was sound. The characteristic mobility of the armor was exploited to the utmost in assigning objec-

tives well in the enemy's rear. These objectives were seized with a speed that could not be matched by the counter efforts of the enemy.

2. The landing of the Green Force at Mersa-bou-Zedjar was a calculated risk that was entirely successful. The terrain was such from the beach to Lourmel that a comparatively small force could have bottled the Green Force in the beach area for some time. A French officer stated later that the beach at Mersa-bou-Zedjar was not defended because they could conceive of no one being fool enough to attempt a landing on such a small beach.

3. The intelligence estimate of the situation and the capabilities of the French was reasonably accurate as far as troop dispositions and reactions were concerned, except for the assumption that the French might capitulate without a struggle. One French officer stated later in reply to a question as to why the French resisted when we came as friends, "We are soldiers. We were ordered to fight so we fought."

4. The decision to load the "maracaibos" to the maximum proved sound, because practically the whole operation, with the exception of the final assault on Oran, was conducted with the units loaded on the "maracaibos." Unloading of other units was so slow that their effect on the operation was negligible.

Lessons

1. Engineer dozers should be landed early in amphibious operations in order to assist the landing of other vehicles over difficult beaches.

2. The effect of seawater on the running gear of vehicles is negligible provided a high grade lubricant is used in all parts of the gear, and that salt water is washed off the vehicle within a few days after the landing.

3. In amphibious operations where radios are to remain silent over long periods,

sets should be checked immediately upon the lifting of radio silence in order to make certain that radio contact can be maintained.

4. Promiscuous firing at airplanes by troops other than antiaircraft causes more damage to our own troops than to enemy airplanes. The first three casualties in TF. Green were caused by the firing of all weapons by all personnel on the beach at an enemy plane which passed over the beachhead at 0830, 8 November.

5. When a task force loses radio contact with its higher headquarters, efforts should

be made to re-establish contact by some other means as rapidly as possible. In this case the commander of the Green Flying Column made no effort to regain contact with the Green main body until his gasoline and ammunition supply became very low. If he had re-established contact and informed the Green Commander that Misserghin was held in strength and furnished guides to facilitate the by-passing of that town by the main body, he could have received supplies and reinforcements almost a day sooner.

We cannot attempt to indicate the profound changes that will take place in the ground forces as a result of employment of nuclear explosives. But it is hard to believe that we shall not find, in the midst of the airborne formations or occupational or police forces of the future, ground force arms differentiated from one another from the standpoint of missions and armament.

General Roydenot, France

With the realization of these facts [development of new and powerful weapons] will also come a highly dangerous and attractive doctrine. It will be said that to protect itself this nation need only rely on its machine power, that it will not need manpower.

This doctrine will be closely akin to the doctrine of negative defense which destroyed France. The folly of the Maginot Line was proved early in the war but too late to save France. The folly of the new doctrine which has already begun to take shape in the thinking of many Americans would also be proved early—but probably too late to save America.

The only effective defense a nation can now maintain is the power of attack. And that power cannot be in machinery alone. There must be men to man the machines. And there must be men to come to close grips with the enemy and tear his operating bases and his productive establishment away from him before the war can end.

General of the Army George C. Marshall

"For the Good of the Team"

Lieutenant Colonel Joseph B. Crawford, *Infantry*
Instructor, Command and General Staff College

NEARLY all American men and boys are interested in some form of team athletics. The expression, "I made the team," brings thrills to fathers and sons alike. The father is proud of the team, and especially of his son for his achievement. He will delight in watching his son grow and improve his own effectiveness as a member of the team. The successful son is happy because he is working in harmony with his teammates, and receives the enthusiastic acclaim of his coach and school-mates.

The principles of teamwork must be understood and applied by members of the military profession. Every military unit is a team composed of players, each of whom occupies an important position with definite tasks. If any member of the team fails to carry out his tasks, the other members of the team carry this additional burden in order to keep up the team's performance.

Military teams in wartime are made up almost entirely of individuals drafted into military service. Some of these individuals may have been drafted against their will. Experience has shown that many individuals of this category are antagonistic. They are "on the team," but

not "of the team." They may have played on athletic teams in the past, but their antagonistic attitude causes them to be a drag on the military team. Their attitude prevents the realization of their full potential as team members.

This kind of attitude must be corrected. The individuals concerned must become "of the team," so that its effectiveness may be increased. The team is only as strong as the individuals who compose it.

National survival is the trophy for which we compete in war. Our teams must not fail. Oblivion is the lot of those who do not succeed.

Teamwork is the basis of our offensive doctrine which is the principle of fire and movement. The team furnishing the fire must be effective in order that the required support will be delivered at the proper time and place to permit the maneuver team to close with the enemy without being destroyed by enemy fire. The team making the movement must work together as a unit in order to advance with the greatest speed, suffer the least exposure to enemy fire, and bring the most effective assault fire to bear on the enemy. Each of these teams must depend upon a

Teamwork constitutes the basis of offensive doctrine, and it is up to every member of the military profession to ask himself if he is ready in any future emergency to discharge his responsibilities to the team

quarterback to plan and coordinate the action so that both the fire and the movement begin and end at the proper time.

The maneuver team, especially, must have a strong will to close with the enemy. It must be willing and eager to accept large risks in order to accomplish its part of the mission assigned the larger team of which it is a part. The members of this maneuver team must trust implicitly the judgment of the individual who plans and coordinates the attack. They must believe in their hearts that he will not risk them without a worthy purpose, without offering them a chance for success and hence survival, or without supporting them by fire power, flank protection, and reserves. If these requirements are not fulfilled, it is difficult for the maneuver troops to understand why their coordinator has failed them. If these conditions are fulfilled, however, then the maneuver team will be willing and eager to do its share in other similar attacks.

A team composed of balanced fire and movement echelons, properly administered, directed, controlled, and supported is a powerful force. It offers to each member of the team an opportunity to expend his full power of resourcefulness, ingenuity, and originality to support the purpose and mission of the team as a whole. The fruits of this team atmosphere are personal and group dependability, resourcefulness, confidence, satisfaction, and determination to win. These factors have been accepted throughout the ages as dependable indications of a potent force. These factors are always present in winning athletic teams; they are also present in winning military teams whether the game is played at Anzio, Iwo-Jima, Normandy, or Okinawa.

But this invigorating, cooperative attitude may not always be present in our units. When it is absent, its place is often filled by rudeness, jealousies, personal antagonisms, and sometimes open hostility. The cause of these last conditions

varies with countless numbers of circumstances. But their presence always results in replacing the potential power of the team by feuds, quarrels and fights. Each ripple in the cooperative atmosphere of a team produces a counter force to act as a brake on the power and effectiveness of the team. The team captain has the problem of determining when the team atmosphere is most effective, when and why it wanes, and how to keep it at its peak. His problem requires him to rely upon his experience, both civilian and military and to exert judgment.

The Team Captain

Athletic teams usually select for team captain the one person who can command the greatest respect and confidence from the members of the team. Often he is not the best batter, or the broken field runner. He is the one who can manage the other members the best and who works best for the good of the team as a whole.

The captain of the military team is submitted to the same type of examination by his teammates as is the captain of the athletic team. The members of the team want their captain to receive genuine satisfaction and enjoyment from his association with them. They want him to place the importance of all individuals, including himself, below that of the team. They expect him to coordinate all of the team activities so that each team function results in good to the team as a whole. They expect him to employ the complete talents of all members of the team to the profit of the group. They expect him to enforce the team standards of accomplishment and to punish, at the proper time and in the proper amount, those individuals who violate the team standard of discipline. The team members are zealous about doing their jobs, and they want their captain to permit them to work in their own way. They welcome control in the sense of coordination of effort toward the accomplishment of the common goal,

but they dislike prohibitions which limit their exercise or initiative, freedom, and ingenuity in accomplishing their assigned tasks.

Proof of these feelings on the part of members of the team is available through research conducted at the Command and General Staff College. Officers who participated in World War II as members of important teams have reported as indicated in the fifteen examples quoted in substance below.

Example Number 1. "This officer always showed up where the fighting was the toughest. He was the type of commander who did not want publicity. He would, for example, ask how you were doing a certain job. If he thought of a better way to accomplish the mission he would ask the question, 'Don't you think that it could be done this way?' He was loved, respected, and obeyed by all the men who served under him. He always worked as a member of the team."

Example Number 2. "This commander had the knack of being able to make staff officers and subordinate commanders feel that each had a great part in shaping the destiny of the unit. Through frequent staff and command conferences he solicited ideas and recommendations and adopted those which had merit. He placed the unit above any one individual, including himself. He had a genuine and unselfish interest in every man in the unit."

Example Number 3. "I served with an officer who, upon taking command of our outfit, made every effort to impress upon the troops the fact that they were considered to be the best in the army. He left no doubt that he, himself, also thought them to be the best. But as a secret between himself and the troops, he let it be known that he considered that the state of discipline and training in the unit had dropped to the point where our unit was no longer worthy of that recognition. He emphasized the fact that the job at hand was to improve the standards of dis-

cipline and training before the public discovered that they were low. These battle experienced troops found themselves undergoing the rudiments of basic training and discipline with only willingness at first, and later with genuine enthusiasm. For the actual execution of his plans, our commander held the officers of the subordinate units strictly responsible. Never did he upbraid an enlisted man for faulty training practices or for violations of discipline. But the officers in the chain of command above the wayward men were told in no uncertain terms."

Example Number 4. "Separate units assigned to armies and attached to corps and further attached to divisions were commonly known as orphan outfits. Because of their frequent changes in attachment, the unit officers and men were particularly sensitive to the small but important attention given to them by the major units to which they were attached. Personal visits of division commanders, not visits for inspection, but visits of inquiry, gave the officers and men of the attached units a feeling of belonging. This personal visit followed up by a policy of treating and caring for attached units as one of their own gave the officers and men of the attached units added incentive to put forth their best efforts in carrying out directives and orders issued by the major units. Commanders of many divisions and higher units did not develop this cordial relation or friendship and as a result did not obtain the maximum willing cooperative effort of the officers and men of the attached units."

Example Number 5. "An officer with whom I served was sincerely interested in his subordinates. When I reported to his unit as a battalion commander, he spent over an hour with me, personally, orienting me on combat conditions and giving me some very sound advice. The atmosphere of the conference was one of man to man rather than of superior to

subordinate. He did this with every officer assigned to the unit. I felt that he was a good friend as well as a superior, that he knew my problems and was interested in my welfare. Further, he never was critical from a distance of the progress on a subordinate unit. If my battalion was not advancing rapidly, he visited me personally and found out what the situation actually was. He then gave all the assistance in his power. I never felt that he was waiting to pounce on me. His attitude was one of full confidence in and loyalty to his subordinates; together with a desire to give them every assistance in doing their job. The result was, as far as I was concerned, that I would go through hell or high water in following his orders because I wanted his approbation rather than because I felt that I would be relieved if I did not do a good job."

Example Number 6. "This officer constantly made the interest of higher headquarters felt in the lower echelons. He made them feel that the higher commander was always interested in their welfare and well-being. He did this by constant visits to the forward elements, even down to the men in the fox holes on the front lines. He called a majority of the men by their names, and took time to talk to each one about his individual job. In my opinion, these personal visits in the presence of danger, his interest in the men, and his calling them by name—all these were of vital importance in maintaining the high morale of the unit."

Example Number 7. "A staff officer in our outfit always gave the impression that he was there to help us with our problem. He was quick to take note of what we had to say or wanted, and he immediately followed up with the action which we desired or else with a courteous note or phone call explaining why our problem could not be cared for at once. He never left us in doubt and always gave us the

impression that he and his assistants were there to help us."

Example Number 8. "During one battle in which I participated, a severe counter-attack was expected. The Assistant Division Commander occupied an observation post on the main line of resistance, and announced to the troops that he intended to spend the day there. The situation was critical because our forces were opposed by veteran enemy troops. By his presence in the front lines, this Assistant Division Commander lent confidence and stability to the troops of the division."

Example Number 9. "The Division Commander called together all the battalion and regimental commanders of the division for an occasion which he called 'debriefing the past operation.' The gathering was very informal, preceded by an excellent dinner and followed by an open discussion. Each battalion commander who had participated in the planning of the operation and had landed with his battalion was called upon to give his personal experience and recommendations for future operations. The manner in which the division commander conducted this conference made every battalion commander present feel that he was an integral part of the division fighting team."

Example Number 10. "I have witnessed conduct on the part of commanders as indicated: a. Personal aloofness and failure to make himself known to the troops. This resulted in one case in a commander publishing a directive to the effect that all men would be instructed as to the name of their commander. b. Another type of conduct was that of establishing a 'headquarters kingdom' and governing the subjects by remote control from the 'palace.'"

Example Number 11. "A commander with whom I served recklessly exposed himself at artillery observation posts for a few moments and then left the assigned observers to bear the shelling caused by his carelessness. On one occasion he failed

to check with the front line commanders regarding the location of the front lines, and as a result his jeep was ambushed, one of his staff officers was killed, and his driver was wounded. Also, he personally took command of companies and platoons during combat for short periods. Instead of inspiring troops he caused a 'What the hell' attitude on the part of the regularly assigned officers. He was reluctant to listen to advice. As a result, his staff officers became 'yes men', and he and his subordinate commanders lacked mutual respect for each other."

Example Number 12. "The assistant division commander was in command of four infantry battalions in the division sector. The enemy had launched a stiff counterattack and had driven the right flank back some 800 yards. The other battalion commanders and I were ordered to the Assistant Division Commander's command post to receive the orders for the attack. In the order the General told each of us the routes to use and the method of attack. He gave these instructions without having been on the ground, and because he had not seen the terrain, he did not pick the best routes of approach. Two of us objected to this, and went into great detail in explaining why it would not be best to attack this way. The General then told us that we would do it his way, and that no more would be said about it. One battalion commander told the General that he felt that he could not follow those instructions because of the large number of casualties which would result in his battalion. The General relieved him of command and ordered the battalion executive officer to take command of the battalion. The battalion commander left the Assistant Division Commander's command post and started to report to the Division Commander when the Assistant Division Commander called him back and told him that he could have the battalion back and also that we could attack the way we had told him that we thought was best.

All this resulted in our losing respect for and confidence in the Assistant Division Commander. First, because he did not visit the battalions to see the terrain, and second, because he evidently did not have confidence in the officers under his command, since he told us exactly how to do our jobs."

Example Number 13. "This officer never seemed to see anything good, but instead he saw many things which he did not like. Subordinate commanders were corrected in their own command posts in front of their officers and men. His criticism was of a fault-finding rather than of a constructive nature. He expressed no definite policies or desires so as to give a clear picture as to what he wanted. His orders were vague and general. Subordinate commanders were often rebuked for expressing opinions or asking questions about points that were not clear. This officer would very often criticize his subordinate commanders to his staff. He showed no loyalty to his subordinates. His concern seemed to be over impressions that might be made on higher commanders, rather than on the welfare of his own command. This officer neither displayed confidence nor inspired it. He was neither impartial nor consistent in his dealings with his subordinates."

Example Number 14. "The commander in my mind had many virtues but in a short time he broke up the unit. He was relieved of his command and the unit soon recovered. He could not decentralize his authority and let his subordinates do their jobs. He followed up his instructions to see how they were being carried out. He irked and worried his subordinate commanders, never left them alone, and worried over small details. Although this officer was of a fine character, he did not have the ability to command the actions of others. His relief from command was brought about because he did not place trust and confidence in his subordinate commanders."

Example Number 15. "I served with a

staff officer who made promises which he did not keep, and who issued orders which he failed to stand behind. He maintained an attitude that the entire staff revolved around him. To cover up his weakness, he employed a sarcastic and insulting attitude toward those who sought help from him. He was actually a detriment to his commander."

The Team

We find with experience that more and more importance is placed upon efficient teamwork. Production line performance is almost completely a matter of refined team play. The piercing of a strong football line or the penetration of a strong military defensive position are the results of effective teamwork.

World War II affords many examples of teams which failed. In many cases the failure of the team brought about the relief of the team captain. This often required the team to become effective under trying conditions, and under the guidance of a complete stranger.

What special quality should a team cap-

tain possess? Is it willingness to accept responsibility? Or boldness? Or brilliance of conception? Or ability already proved?

General Omar Bradley was asked these questions during World War II. General Bradley stated that he considered "Selflessness" as the most important quality for a team captain. He reasoned that a man who is selfless tackles a job given him with all his heart and courage and interest; that he thinks only of what he can get done for his country, his commander, and his team; and that he does not begin to think about himself until his job is about finished, if he does so then, because he is too busy, too intent on selfless service.

Teamwork and discipline are thought by some military persons to be synonymous. General Marshall is said to have defined discipline as "cheerful and understanding subordination of the individual to the good of the team."

Every military man should ask himself the question, "If the next emergency should come tomorrow, am I ready to discharge my responsibilities to the team?"

Events have amply shown that a splendid spirit of cooperation was established between the British and American services, and that under General Eisenhower a strong loyal team was quickly brought into being, while the various components of the great invasion force were welded into a fine fighting machine.

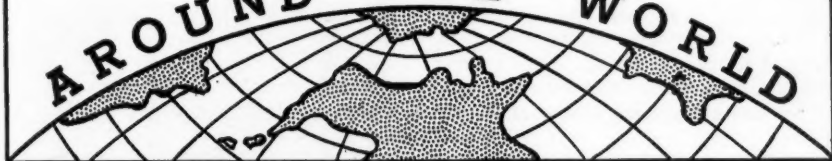
Field Marshal Viscount Bernard L. Montgomery

Because such teamwork (air-sea-ground) complicates warfare beyond concepts accepted as recently as 1941, military leadership is of more critical importance than ever before. Highly trained and skilled troops, supported by great numbers of technical specialists, who together will largely form the Army from now on, cannot be led successfully in battle except by officers who possess—in addition to the human traits and qualities inseparable from leadership—a thorough knowledge and mastery of their basic arms, and of the combined employment of all arms and services.

General of the Army Dwight D. Eisenhower

MILITARY NOTES

AROUND THE WORLD



PERSIA

Aviation Council

The formation of a Grand Council of Aviation to coordinate all military and civil aviation matters is reported in Persia. The Inspector General of the Persian Air Force is the President of the Council, and members include the Director of the Department of Civil Aviation, the Head of the Persian Air Force, one technical officer and a legal advisor. The exact functions of the Council are not known.

The Persian Air Force is organized into two regiments—one Bomber and one Reconnaissance. Both regiments are stationed at Doshan Teppah airfield, Teheran, with small detachments disposed from time to time in different parts of the country.

Flying training is carried out at Doshan Teppah. The school consists of three groups, Elementary, Service and Advanced. There is also one ground training group. The majority of the trainees are officers, but NCOs are also trained.

The aircraft include Anson, Tiger Moth, Hawker Hind, Audax and Fury types. Hurricane aircraft have been reconditioned and assembled in Persia by Persian engineers aided by a small team of Hawker and Rolls Royce personnel.—*Journal of the Royal United Service Institution.*

ETHIOPIA

Visit by Montgomery

During his African tour, Field Marshal Lord Montgomery visited Ethiopia, where there is a British Military Mission. During the visit, Montgomery inspected troops of



Inspecting Ethiopian troops.

the Ethiopian Imperial Army.—*The Illustrated London News.*

THE NETHERLANDS

Air Force

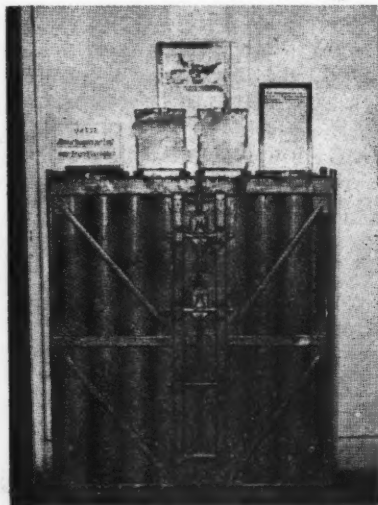
The program for the re-creation of the Dutch Air Force contemplates the organization of a total of twenty-four air squadrons.—*Flugwehr und-Technik* (Switzerland).

USSR

Aerial Release Case

The Soviet AK-2 release case for aerial distribution of chemical agents consists of sixteen hollow tubes, each about four and one-half feet long and five inches in diameter, arranged in two rows in a chromemolybdenum frame, for holding spherical incendiary or vesicant containers.

The containers are thin-walled tin

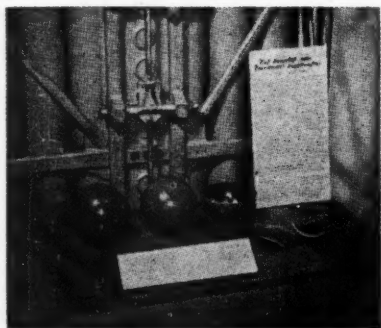


Soviet aerial release case AK-2.

balls, slightly less than five inches in diameter. These spheres are made of segments, welded together so that they disintegrate upon striking the ground, scattering the filling over the terrain. The content of each sphere is about 1 liter; fillings used are about two pounds of a 50-50 mustard-Lewisite mixture or about two pounds of a solution of yellow phosphorous in technical carbon disulfide.

In use, the AK-2 release case is suspended vertically in the airplane bomb

bay, with the mouth of the tube pointing downward. Prior to discharge, the tubes are closed by remotely controlled lids,



Spherical chemical containers.

each of which covers the opening of four tubes.

Each tube contains fifteen of the spherical containers, so that the case holds a total of 240 containers. The case discharges in one and a half seconds. The Russian transport-bomber TB-3 was the airplane chiefly equipped with these cases. Four cases were installed in the airplane to give a total capacity of 960 individual containers. As each container follows its own path after release, the only control over dispersion was achieved by variations in the altitude of the plane.—*Chemical Corps Journal*.

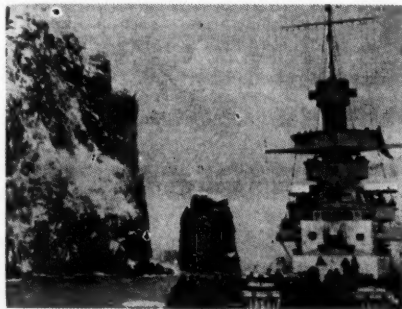
Stereo-Photo Maps

Soviet cartography has initiated a new method of stereoscopic representation of terrain. This requires two photographs of the terrain made with long-range objectives of sectors proportional to the height at which the photographs are made. The method permits viewing as large a section of map as desired without any optical device.—*Skrzydłata Polska*.

ARGENTINA

Antarctic Base

Sailors and Marines are shown on the deck of an Argentine warship under the



towering cliffs of Deception Island, where Argentina has established a base.—*The Illustrated London News*.

Troop Carriers

Five British Bristol Type 170 aircraft have been converted into troop carriers by the Transport Command of the Argentine Air Force. Each plane carries thirty-five troops with equipment, and the fleet is accompanied into action by a Type 170 Wayfarer aircraft which has been fitted out as a mobile workshop. This airborne fleet made its first appearance at the maneuvers held at San Miguel del Monte.—*The Aeroplane*.

CHILE

Navy Tugs

Three ocean-going tugs purchased from the United States have joined the Chilean Navy. Two hundred twenty-eight officers and men, trained in the United States in the technique of operating such vessels, returned with them to Chile to join an ex-British battleship and forty to fifty other vessels of the Chilean Navy. The three craft have been renamed *Remolcador 1, 2 and 3*.—*All Hands*.

BRAZIL

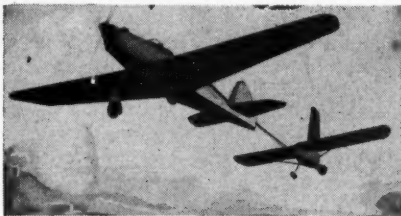
Builds New-type Jet

Brazilian Professor Enio Pestana recently displayed a jet motor of his invention, the first to be made in Brazil. It is a gas turbine of the continuous combustion type, similar to a turbo-jet.—*Brazilian Bulletin*.

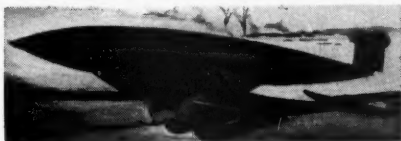
GERMANY

Air Trailers

Germany conducted an extensive development program on shaft-towed aircraft



Fieseler P 21A Air Trailer.



Flying Bomb Trailer.

trailers during World War II. Among the models tested were the Fieseler P 21A, a 20-foot span scale model which was used for stability tests. A universal-jointed shaft connected it to the towing aircraft, and it had a two-wheeled undercarriage for take-off. One type tested was a device for air launching the FZG 76 Flying Bomb. The latter consisted of a standard flying bomb fitted with a two-wheel undercarriage and tow bar. The undercarriage was designed for jettisoning soon after take-off, and the tow bar was detached when the bomb had been released.—*The Aeroplane Spotter*.

FRANCE

Unification

The French Government has published a decree establishing a combined general staff. For several years France has had a Ministry of the Armed Forces with separate Secretaries of State for the Army, the Navy, and the Air Force, each with its own staff, all operating together as the National Defense General Staff in an advisory capacity to the Prime Minister and the President. The new decree is designed to create a compact defense organization with an over-all general staff directing all activities of the three separate services, and working closely with the Prime Minister in all matters concerning military strategy as related to foreign affairs.—*Army and Navy Journal*.

Uranium Deposits

New veins of uranium have been uncovered in the mountainous center of France. Although the new veins are commercially feasible, the limited French refining potential closely limits their value.

The administrator of the French Atomic Energy Commission said that teams of prospectors had unearthed the new veins during the past two years. The new discoveries were understood to have taken place in the Departments of the Rhone, Haute-Vienne and Creuse.—*The New York Times*.

AUSTRALIA

Defense Workers

The Australian Government is stepping up plans for the training of research workers to develop the scientific side of its five-year defense program. Of the \$800,000,000 allocated, \$139,200,000 will be used for scientific research. The Defense Minister said that it was improbable that German scientists now being brought to Australia would be used on defense work.—*Australian News Summary*.

CANADA

Alcan Communications

The governments of Canada and the United States have announced an agreement concerning the operation of certain of the telephone and telegraph lines constructed during the war between Edmonton, Alberta, Canada, and the Alaskan-Canadian border.

These lines provide direct communication between Canada, the United States and the interior of Alaska. They are available for transmission of telephone and telegraph messages of private industry and individuals and are handling a steadily increasing volume of commercial traffic. They were built during the war under the technical supervision of the United States Army Signal Corps and at the conclusion of hostilities were sold to and are now operated by the Canadian Government.

These facilities parallel the highway from Edmonton, Alberta, to the Alaskan-Canadian border, which is approximately seventeen hundred miles from Edmonton. At the boundary the Canadian portion of the lines connects with the Alaska communication system which provides telephone and telegraph service for the territory of Alaska.

The agreement is to remain in force until the two governments mutually consent to terminate it or after one year's notice by either government.—Department of the Army.

BURMA

Britain's Forces Leave

Burmese crowds bade farewell in March to the last official contingent of British troops in Burma, who left Rangoon on the steamer *Karoa* for Singapore, whence they shipped for Britain. About 700 British Army and Royal Air Force personnel, who had been engaged in final administrative duties, were cheered as they drove through the streets.—*The New York Times*.

GREAT BRITAIN

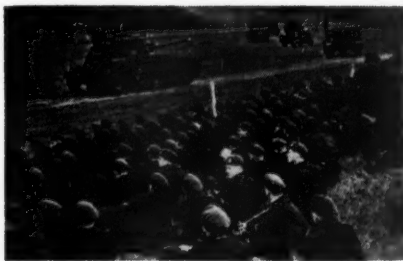
Artillery Demonstration



American 240-mm (9.4 in.) howitzer, above, being fired by British troops.

Of special interest to spectators at a recent demonstration presented by the School of Artillery, Larkhill, was the 240-mm howitzer of American design, a weapon which fires a 360-pound shell 25,250 yards. The howitzer, which breaks down into two tractor-towed loads for traveling, supersedes the 12 inch howitzer as the largest piece of artillery in the field.

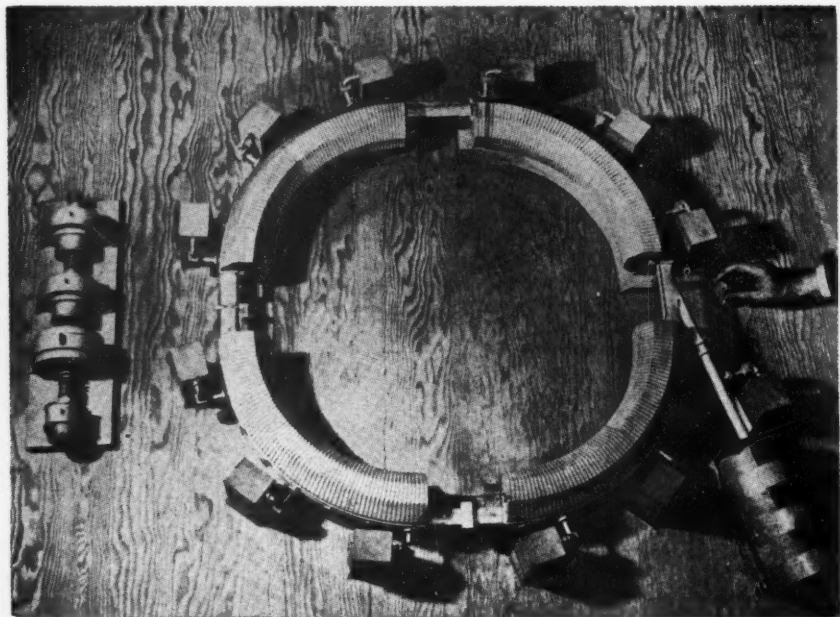
Also shown were new self-propelled antitank weapons, and helicopters used as aerial observation posts for adjustment of artillery fire.—*The Illustrated London News*.



Self-propelled 17-pounder antitank gun on a Valentine chassis at British Artillery demonstration.

UNITED STATES

New Atom-Smasher



Model of a giant atom-smasher.

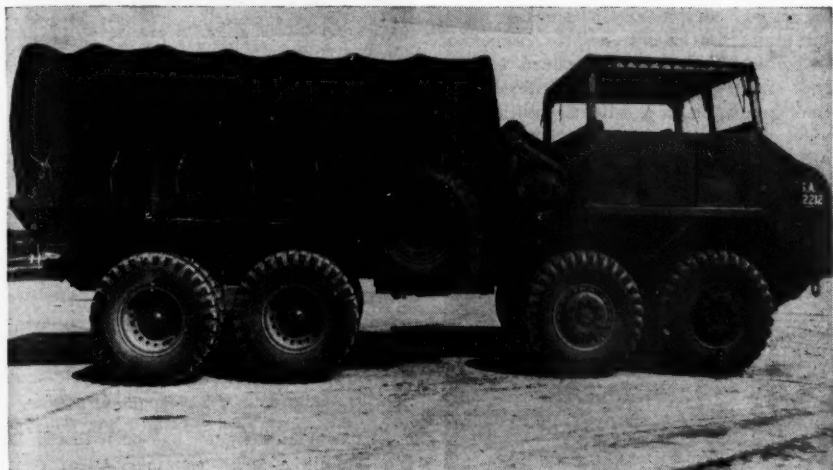
The construction on the University of California campus of a \$9,000,000 atom-smasher, nearly eighteen times as powerful as the largest now in existence, has been announced. The project is being financed by the United States Atomic Energy Commission.

The Atomic Energy Commission chairman, referring to the absence of an international agreement on control of atomic energy, said the decision to build the new cyclotron represented "notice to the world of the intention of the people of the United States to become pre-eminent in and to widen the lead of this country in the development of fundamental science of all kinds."

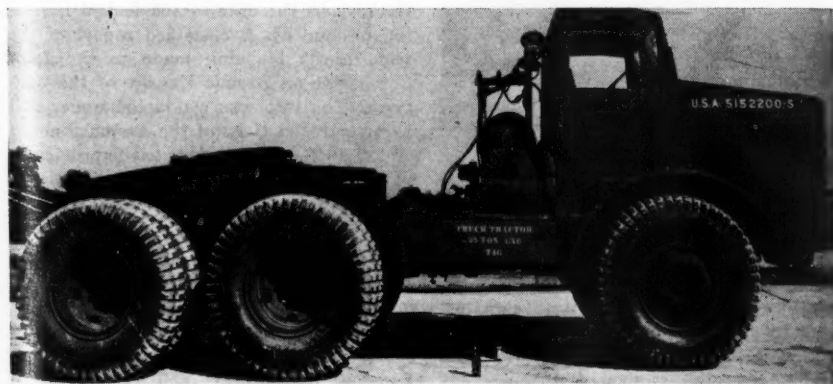
So powerful will the new cyclotron be that it is expected to develop energies of six billion electron volts with protons and perhaps ten billion with the use of alpha particles.

The new atom-smasher will have a ring-shaped magnet requiring 10,000 tons of steel. Operating from a 5,000-kilowatt power source, the magnet will have a radius of 55 feet and a length from the outside limits, of 140 feet.

Protons will be ejected into the accelerating chamber by a subsidiary atom-smasher and will make more than one million trips around the magnet before reaching energies of six billion electron volts.—*The New York Times.*

New Ordnance Vehicles

Among the heavier Ordnance vehicles developed at the Aberdeen Proving Ground are these two types. Above, Truck, 12-Ton, 8 x 8, T33E1 (Corbitt). Below, Truck-Tractor, 25-Ton, 6 x 6, T46.



"Canned" Equipment

Shortly after the end of World War II hostilities, Army Ordnance "canned" guns and other equipment in special metal containers. In recent months, some of the containers have been opened to spot check the equipment. The matériel has been found to be in excellent condition and ready, almost without exception, for immediate use in the event of an emergency. The Ordnance Department's inspections



A 90-mm gun exposed after steel container is cut away.

are the first of their kind to be reported, although the Navy and Air Force have "canned" and "cocooned" ships, planes and other equipment. On the basis of inspections made to date, the Ordnance Department concludes that the canning process is technically successful in maintaining the high quality and usefulness of Ordnance matériel preserved by this process.—Signal Corps photos.



Packs of 60-mm mortars after removal from containers.

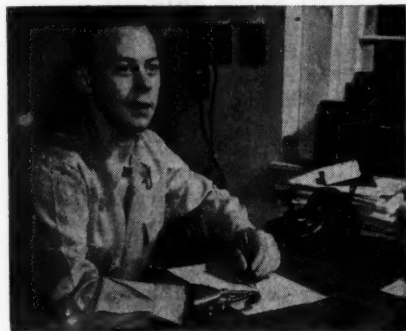
Atomic Weapon Test

An "atomic weapon" has been tested at the Atomic Energy Commission proving grounds at Eniwetok Atoll in the Marshall Islands. The Commission's terse announcement follows:

"There has been a test of an atomic weapon at the proving grounds of the Atomic Energy Commission on Eniwetok Atoll in the Marshall Islands. For security reasons the date of the test is not being announced. A classified report of the test results is being made to the Joint Committee on Atomic Energy of the Congress. The test was conducted under full security restrictions of the Atomic Energy Act of 1946, and pursuant to the provisions of the Act, the public issuance of further information concerning the test is not permissible at present."

This latest test was in sharp contrast to the highly publicized tests of the Nagasaki-type bombs at Bikini on 1 and 25 July 1947, when representatives of press, radio, newsreel producers, members of Congress and military and naval attachés of foreign powers were invited to be present.—*Army and Navy Journal*.

Cosmetic Hand



Amputee demonstrating use of the new cosmetic hand.

After nearly three years of research and experimentation the Army's Prosthetic Research Laboratory, Forest Glen, Md., has developed a cosmetic hand that is life-like in appearance and may be adapted to many tasks normally allotted its human counterpart. The primary improvements of the hand over the hook are its appearance and facility of articulation.—US Army photo.

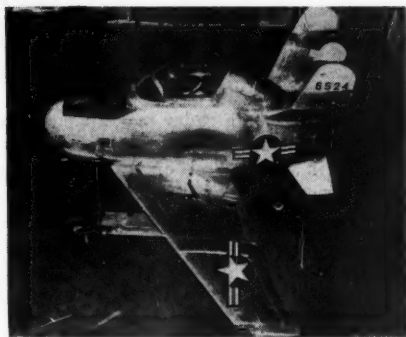
Radar-repellant Paint

Preventing accurate radar spotting of planes by sowing the air ahead of them with quantities of wave-scattering aluminum "window" was a technique used during World War II. Now comes a method whereby the plane itself in effect becomes its own "window."

The basic idea is very simple. Coat the plane with some substance that is a poor reflector of radar waves, as dull paint is of light waves. Three such substances have been found to be cuprous oxide and the elements selenium and tellurium. Various methods of applying the coatings, all involving rolling or pressure at fairly high temperatures, have been devised.—*Science Digest*.

Parasite Fighter

The USAF parasite fighter plane, the McDonnell XF-85, has been completed for testing. It is designed to fit in the bomb bay of a Consolidated-Vultee B-36, and is being flight tested from a modified B-29. It has a wing span of twenty-one feet and is fifteen feet long, with the wings folded within the bomb bay and extended for flight. All take-offs and landings are made in flight, thus the plane has no landing gear. The XF-85 is



McDonnell XF-85 Parasite fighter.—US Air Force photo.

powered by a Westinghouse J-34 jet engine capable of 3,000 pounds thrust.—Department of the Air Force.

Jet Cooler

A "sweatcooling" system which operates similar to perspiration of the human body has been found to increase the efficiency of turbo-jet engines. Large amounts of coolants are forced through porous metal walls of the combustion chamber at low pressure. The common gases, nitrogen and hydrogen, have been found the most satisfactory coolants. The coolant forms a layer of gas between the wall of the chamber and the hot flame. This protects the chamber wall and reduces heat loss.—*Science News Letter*.

Miscellaneous Notes

Historical Series

• The second volume in the series, *History of the United States Army in World War II*, entitled "The Procurement and Training of Ground Combat Troops," has been published and distributed by the Government Printing Office. The volume was written by the Historical Section of the Army Ground Forces during World War II and presents vividly many of the problems encountered in preparing for combat a ground army extensive enough to meet world-wide requirements.—Department of the Army.

Radar Charts Bullet Course

New advances in radar make it possible to chart the speed of a bullet while it is still in the barrel of a gun. These advances also make it possible for soldiers in the field to detect the location of artillery firing on them and to pick out a moving tank from the clutter of other motionless objects on the radar screen. The new equipment can discover moving troops and is light enough to be carried in the field by soldiers.—*Ordnance*.

New Drug

The Commandant of the Army Medical Department Research and Graduate School has disclosed the findings of recent experiments conducted at Kuala Lumpur, Malaya, in combating scrub typhus with chloromycetin, the new, so-called "miracle drug."

Using groups composed of equal numbers of Europeans, Malaysians, East Indians and Chinese, the medical personnel found that chloromycetin reduced the duration of fever, the period of hospitalization, and the incidence of complications in scrub fever. Previous laboratory experiments with the drug have proved effective against rickettsial diseases other than scrub typhus.

Malaya was chosen as a test base because of a high rate of scrub typhus in that region.—Department of the Army.

Swimmers in the Arctic

Marine Corps and Navy underwater swimmers trained during the war have penetrated Arctic ice and slush in below-surface forays in recent Alaskan maneuvers.

Operating from submarines off Kodiak Island, the rubber-suited swimmers knifed through slush six inches deep and brushed against four-inch ice to carry out assignments. They were able to remain in water estimated at four degrees below freezing for periods of more than an hour.

Underwater scouting teams were developed by the Marine Corps and the Navy during World War II to blast obstacles from enemy beaches in pre-invasion missions.—*The New York Times*.

U.S. Air Force History

The Department of the Air Force has released Volume I, "Plans and Early Operation," the first of a seven volume series covering the history of *The Army Air Forces in World War II*. The volume is a well-documented and authentic record of this phase of air activity. The series has been prepared by a staff of civilian historians who have had access to all records and documents considered essential in preparing such a project.—Department of the Air Force.

New Type Communication

A new type of communication which may possibly be employed in communication between airplanes, or from ship to ship on the ocean, has been developed.

The system utilizes invisible radio waves, infra-red rays, or sound too high-pitched for the human ear. The signals are sent from an instrument and returned to the same instrument from a distant reflector. On the outward trip they carry no message. Returning, however, they bring signals with meaning. The reflector is excited by the waves received, which changes or modulates the waves before returning them.—*Science News Letter*.



FOREIGN MILITARY DIGESTS

A Preview of Atomic Warfare

Digested by the **MILITARY REVIEW** from an article by P. H. H. Bryan in "The Fighting Forces" (Great Britain) August 1947.

At every new discovery of some new method of destruction, the end of soldiering is confidentially predicted. Since the invention of gunpowder in 1320, and throughout all the developments of cannon, Maxim guns, tanks and airplanes, the doom of the military art has been prophesied at every stage. However, as we all know, nothing of the sort happened. Far from the soldier's trade becoming redundant, the bigger and brighter wars created by increased fire-power and increased speed, stepped up the standard of skill required of the tactician.

Most British people were deceived by the propaganda of the strategic bombing enthusiasts during World War II. Few people stopped to realize that the country had put its money on the wrong horse, and that had we had to fight on our own, we would have been in a singularly helpless position. We squandered nearly one million men on an Air Force, and a large portion of industry was devoted to manufacturing planes and bombs. The results of bombing were found to be very disappointing, and we could have gone on bombing Germany and the Continent with high explosives for fifty years without producing the slightest decisive result; Germany could have counter-bombed us in revenge. All either side would

have achieved would have been a constant civilian death roll and a staggering bill of expenses every year, for bombing is an expensive game; often the cost of a raid is more than the cost of the few blocks of tenements it may destroy.

The atom bomb is being regarded solely in the light of this war-of-attrition strategy, and somewhat rash conclusions have been drawn from the effects of its first use in Japan. Used as a terror weapon against Japanese civilians, it caused the surrender of that nation. But let there be no mistake about this—it was the surprise effect of this atom bomb and the unpreparedness of the Japanese to meet it, that contributed mostly to its success. The same effect would have been made had we launched a thousand-bomber raid on Berlin, if the Germans had had no air raid precautions, no shelters, and no previous knowledge of heavy bombs. The element of surprise in the atomic field has now been sacrificed—the same trick cannot be worked twice. Air raid precautions of all nations will in the future be adapted to the new warfare, and most important of all, in a few years all countries will be in possession of this new high-destruction agent. Attack will not only fail to

meet with such instantaneous success as in Japan, but it will lead to reprisals, and the same old war-of-attrition will start all over again.

Mr. Baldwin made one of his few accurate prophecies when he said: "The bomber will always get through." The bomber in World War II always did get through, and even 5 per cent was considered quite a loss. Even more so will self-piloting projectiles get through.

It is very obvious now that our leaders are thinking in terms of offensive atom warfare of the future along the same lines as our past strategical bombing. Strategical bombing is a polite name for the re-hash of the old principle of trying to win wars against another nation by terrorizing and killing the civilian population. It is strikingly unoriginal. In the early days of North America, the redskins would await the time when the armed settler was away in the fields, and descend on his homestead, killing his wife and children, slaughtering the livestock and burning the property. If the redskin had gone to grammar school, he would have answered any reproach by saying that he was quite justified in destroying the means of production of the enemy and in lowering his morale by killing his women and children; that this system saved many redskin lives, as, if the redskin tribe tackled the armed settler on his own, many of them would probably have been hurt. In the Eighteenth Century, Nadir Shah, without ever having read a Bomber Command Pamphlet or heard a Churchill speech, marched upon Delhi and indulged in a wholesale massacre of civilians in that city, which compared favorably in quality, although not in quantity, with the result of bombing the cities of the Continent. Nadir Shah, if he had been born a couple of centuries later, would have said that the Delhi citizens were all war workers, whose labor assisted the

Mogul army, and he would have been hailed as a great war leader.

The higher forms of man had discarded these methods of warfare for quite a long time prior to the Twentieth Century. The more civilized and virile races recoiled with horror at the idea of murdering a man's family because one was a little afraid of the man himself. Nowadays we all talk about "war production" as if it were a recent innovation in warfare, but Harold of England and William of Normandy needed a lot of swords, saddles, armor, harness, uniforms, bows, horses, ships, food and fuel, all of which entailed a considerable amount of civilian labor, but neither Harold nor William I seriously contemplated mass slaughter of enemy harness-makers and ship-builders as part of his strategy.

Apart from the moral objections to indirect warfare, that is, avoiding conflict with the enemy's army and striking at his womenfolk and industry, it should be clear that this method applied to atom bombing will bring little decisive result, and, what is really the crux of the matter, it will not provide us with any means of protection against reprisal atom bombing.

The atom projectile will always get through. Let there be not a shadow of doubt concerning this. Their launching sites will be deep underground, only coming to the surface in order to launch a projectile. These sites will be scattered all over a country and will be immune from the effects of atom-bombing themselves, so that if a country is attacked by atom bombs by an enemy, counter-bombing will be useless as a defense. All that will happen is terrible surface destruction on both sides, while the protected launching sites in both countries remain intact. Thus will the stage be set for a futile, wasteful, and purposeless war-of-attrition, a madman's dream of war.

Atom bombing provides no defense

against atom bombing; how then, can we protect our country and our families from such projectiles launched by some callous foe from possibly thousands of miles away?

Despite all the inventions and discoveries of the centuries, one factor in war remains fairly constant—the human body. Unlike cities, docks and ships, it is invisible from the air and usually invisible from the ground; a little ditch a foot deep, a fold in the ground, or a small mound of turf will provide it protection from blast capable of knocking down several blocks of buildings, or sinking a battleship.

In 1943 and 1944 the Allied Chiefs were discovering that after the high-destruction machines—the planes, the tanks, and the artillery—had razed an area fairly flat, the human body, in the shape of a live enemy infantryman, was still unaccountably there. And not only was he there, but he often had additional protection provided in the form of craters and ruins. For all he was concerned, airplanes and blockbusters might just as well have never been invented. The only way to shift such an unsportsmanlike gentleman was to send in a similar killer, armed with portable weapons, to locate and destroy him in fact, and not merely in a military or air force *communiqué*. This combat was conducted at a range of from twelve inches to some hundreds of yards. It soon became very obvious that in this ultimate and most decisive combat or war, the super highly destructive agencies that modern science had created could not be used, as friend and foe were so close to each other that both sides would be killed. Thus, heavy bombs could not be used against German troops fighting with our infantry, and actually the best-size bombs for direct air support were the 250-lb and 500-lb bombs—mere pygmy affairs.

This principle will apply in exactly the same way to the atom bomb. A bomb that

will raze six square miles will not be of the slightest advantage when our troops and the enemy troops are within a few hundred yards of each other, or possibly intermingled. This factor has, of course, been present in warfare ever since the first missile was invented. The greater the “killing” or “damaging” area of a missile, the more limited is the movement of one's own close-quarter combat troops. The Eighteenth Century soldier could not use grape shot and the saber at the same time any more than the Twentieth Century soldier could use simultaneously 25-pounders and tommy guns.

The increase of destructive power of missiles was comparatively slow and gradual up until 1945. At the pinnacle of the high-explosive era in warfare hand grenades had a damaging area of a few square feet, artillery shells a few square yards, and the largest of bombs only a few hundred square yards. Armies were able to move, live and bivouac in much the same way as they had done in Caesar's time. The setting of war—hills, plains, rivers—had remained unaltered through the ages. The sizes of familiar objects—men, houses, roads, villages, vehicles—were in the proportion they always had been. The greatest high explosive missiles of 1945, with their few hundred square yards of destruction, did not, therefore, alter radically the general picture of war.

The atom missile has altered this picture. One such missile can shatter an area measured in square miles. In the past, our plans for attacking an enemy armed with spears and an enemy armed with artillery and bombers, would have been very similar, except that in the latter case we would keep large bodies of men and vehicles half a dozen miles away because of his bombers, to avoid the pinpricks they might give us. But we cannot entertain the idea of ap-

proaching and attacking an atomic-armed enemy in anything like the same fashion.

In the coming Atomic Warfare, the less near you are to the enemy the more chance you will have of being destroyed *en masse*.

The most feasible defense against atom projectile bombardment will be to destroy the trouble at the source—the launching site; to destroy dug-in positions required by the agile and calculating machine of war—*Man*. To convey him to the enemy country there will only be one practical method of approaching hostile shores in the Atom Era, and that is the high-speed airplane. Large, slow-moving targets such as ships at sea or motorized formations on land, will be doomed to extinction. Only the fast airplane can achieve the speed and therefore the surprise for invasion. Only the airplane can achieve the speed required for a lightning reply to a hail of atom bombs on the homeland, for every extra hour will bring enormous destruction.

In Atomic Warfare there can be no gradual approach of armies towards the enemy lines. There can be no rear areas and ground lines of communication, of administration, supply and transport, as we know them today. The air-landed infantry, which will be the only decisive defense against the atom bomb, will be entirely close-assault troops. They will have to land close enough to the enemy to make it impossible for him to use his bigger atomic artillery. Between the time of landing and the first close con-

tact with the enemy will be the critical period for them; location by the enemy during this period will be the thing to avoid, and it is in this respect that the true infantry attributes of concealability and agility will come to the force. Every yard nearer the enemy, the safer they will be. They will be safest in the close-contact assault, for then the enemy can only use ammunition of the same destruction area as that of the invading force, and the battle will proceed on conventional infantry versus infantry terms, at the unalterable ranges of twelve inches or so to a few hundred yards.

The strategical and tactical essence of the contract of Atomic Warfare will be to close with the enemy in as short a space of time as possible. "Close or perish" may well be the future motto of the Army.

The air-landed assault troops will be our only salvation against mass slaughter at home. The launching sites of the V-bombs of World War II, now simply relics of what was a comparatively mild and harmless weapon, were only eventually put out of action by getting men in on the ground. But in the next war we shall not be able to spend three years in building up an invasion armada (which would be useless, anyway) and launching a mass attack at 20 miles per hour; we shall have to get moving in a few hours, and our airborne infantry will have to travel at five or six hundred miles an hour—or not at all.

Because the first attack in a future war may be unexpected and devastating, it is necessary that the armed forces of today constitute a national military organization ready for instant action. The repetition of another Pearl Harbor or several greater disasters will, perhaps, not permit so long a period of preparation as was accorded the United States.

General Tristão A. Araripe, Brazil

The Employment of Airborne Troops

Translated and digested by the MILITARY REVIEW from an article in "Allgemeine Schweizerische Militärzeitung" (Switzerland) December 1947.

THE first country to concern itself with the future possibilities of airborne troops was Russia. Germany, however, led the way from theory to practice. In May 1940, German airborne troops took part in the invasion of the Netherlands, thereby beginning the chapter of airborne operations. After this, such operations were carried out on various occasions during the war. Among the best known were the German conquest of Crete, a victory which was won almost entirely from the air; the Allied operations at the time of the Normandy landing; and, later, at Arnhem. The airborne troops which were employed at the crossing of the Rhine in the spring of 1945 compensated for the defeat at Arnhem and again proved the high combat value of the new arm.

In addition to the employment of airborne troops in large numbers in an operational sense, during the last war, tactical employment of airborne troops in small combat groups likewise proved their combat strength and value. These small combat groups were of varying strength, but as a rule did not exceed fifty men.

The first employment of small groups of paratroops in the western theater of operations took place on the occasion of the taking of the Belgian fortress, Eben Emael, one of the main strongpoints in the Albert Canal system of fortifications. This fortress was taken in May 1940 after a short but hard fight by a small group of German paratroops. With the exception of a small number of airborne troops which were sporadically employed in June 1940 during the battle of France, the German high command made no further use of airborne forces during the German offensive in western Europe.

British Tactics

It was not till later that a new theory was created concerning the employment of airborne troops. The English high command had determined in 1941 to set down airborne forces in small groups behind the enemy's lines, since it appeared impossible in the immediate future to carry out an airborne operation on a large scale. For this purpose, a new formation was created which soon became known by the name of SAS (Special Air Service). The SAS underwent its baptism of fire in Libya where it specialized in attacks on airdromes. Later, night operations were extended to Tripolitania where airdromes which were situated more than 600 kilometers back of the front were attacked, and large numbers of planes were destroyed. The strength of these groups seldom exceeded twenty-four men, yet in spite of this, the SAS inflicted heavy losses on the enemy. At the same time, the SAS compelled the Afrika Korps to employ strong reserve units for the protection of airdromes.

During the remainder of the war in the Mediterranean, only small airborne operations were carried out in southern Italy and Sicily by the SAS, but all of these were not successful. The lessons learned were valuable, however, for it was proved that the SAS obtained the best results when it confined itself to demolition operations. Attacks on important strong points proved, in general, to be too costly, since the airborne troops did not possess enough heavy infantry weapons to be able rapidly to crush the enemy. But for operations behind the enemy's lines, the SAS was able to prepare itself beforehand for its attacks on less vigorously defended objectives and, at a suitable moment, destroy them. Targets

of this sort included railway bridges, electric power plants, ammunition dumps, etc.

During the month preceding the invasion of Normandy, the Allied high command decided to give aid to the various resistance movements in western Europe. It was also considered advisable to permit Allied troops to take part in the secret campaign which was being waged against the German communication lines. The SAS was the ideal instrument for this task. At the same time, an American organization similar to the SAS was created and placed under the command of Major General W.A. Donovan, Chief of the Office of Strategic Services. The American organization worked in close collaboration with the SAS which, at first, consisted of English personnel, but later included French, Belgian and other units. The first attempts of the SAS in western Europe were made in Brittany where English and French SAS units organized the local resistance forces. Later, the 3d French SAS Battalion paved the way for the American drive into Brittany which was rapidly executed as soon as the Third American Army had broken through the German position at Avranches in August 1944. The system used by the SAS was almost always the same. First, a base was established at some remote area from which night operations could be carried out. After this, the local resistance forces were contacted and reorganized.

The activity back of the German lines produced a considerable effect both from the material and psychological points of view. First, the SAS groups succeeded in greatly upsetting lines of communication, in destroying small German troop formations and frequently attacked large supply columns. In the second place, these attacks had a considerable morale effect on the *Wehrmacht* which no longer felt any security in its rear. In order to mitigate this situation, the German high command had to attempt vigorous

countermeasures. Strong German formations were held behind the front to liquidate the Allied airborne forces. But since the latter were only lightly armed, and had no supply problems to worry them, they were capable of rapid movements so that their capture put the *Wehrmacht* to a great deal of trouble and was seldom effected.

RAF Cooperation

The relatively small losses of the SAS were partly due to the fact that the RAF worked in close collaboration with them. The RAF not only had charge of the transportation of the groups at the beginning of their mission, but also of their removal as soon as their return was considered advisable. As an auxiliary service, the SAS obtained important information which was of particular interest to the RAF or the United States Air Force. Objects which the SAS discovered but which it was unable to destroy were often made the objectives of bombing attacks.

During the course of the fighting in France, Belgium and Holland in 1944 and 1945, the SAS played an increasingly important role. At Arnhem, SAS groups filtered through the German lines and attacked from the rear. They were particularly successful in their night attacks on armored units, since tanks lose a large part of their maneuvering speed in the dark and become very vulnerable.

When the Allies crossed the Rhine in the spring of 1945, SAS groups again rendered great service. They interfered with the German retreat, destroyed a great deal of enemy equipment and took many prisoners. It was at this time that larger formations were used. The tactics employed differed considerably from those of the earlier SAS operations. Danger of betrayal by the civil population permitted operations only in the vicinity of the front nor could local resistance forces be counted on. In spite of these

difficult conditions, the SAS achieved valuable results especially in the destruction of German railway and highway connections.

The military requirements were extremely difficult in the case of airborne troops. They had to be able to take care of themselves alone under the most difficult conditions. Endurance, discipline and mobility formed the basis of these requirements and, in addition, technical knowledge

hardest tests, their morale has always remained unshaken.

From 1942 on, the Allies gained a considerable lead over the Germans in the employment of airborne troops for the German high command had carried out no such operation in the western theater of operations since 1940. It was soon realized in Germany, however, that special troops, such as the SAS, were able to achieve excellent results. One of the best known



Waves of United States paratroopers dropping from troop carriers near Grave, Holland, September 1944.—Army Signal Corps photo.

of weapons and explosives of all sorts was required. During the period of preparation, no special privileges were given to officers. They were obliged to take the same courses and live on the same footing as the enlisted men in order to increase mutual confidence and understanding. As soon, however, as the groups went into action, iron discipline became evident. Air landed troops have always exhibited great *esprit de corps*. Even after the

commanders of the S.S., Skorzeny, was assigned the mission of creating similar combat groups. His successes were no less than those of the Allies. The liberation of Mussolini on the Gran Sasso in September 1943, proves that Skorzeny knew how to carry out operations of this sort successfully.

Men who are suitable for employment as airborne troops are to be found in all armies. Enthusiasm, self-confidence and

ability to engage in combat under the most difficult of circumstances are the necessary requirements for making an airborne soldier out of an infantryman. Additional ability is indispensable for officers and noncommissioned officers. Units of this sort require especially thorough training. The technical difficulties in transforming infantry into airborne forces are relatively slight. Parachute training requires but little equipment. To begin with, the men are trained, by means of physical exercises,

at night, the candidate is a finished parachute jumper. At the conclusion of the parachute training, technical combat training is continued. A period of ten weeks should be sufficient for carrying out this portion of the program. The duration of the entire period of training would, therefore, be about four months. For officers, naturally, a longer period is required since tactical knowledge must also be acquired.

The last years of the war showed that guerrilla warfare can be extremely successful in mountainous terrain. The



United States 82d Airborne Division paratrooper after completing training jump into snow.—Army Signal Corps photo.

until their reflexes are rapid and accurate. During the second phase there is jumping practice to accustom the men to the feeling of the drop. For this purpose, the future airborne soldier is strapped to a piece of apparatus which lets him drop about 10 meters, but with his descent checked sufficiently to prevent his landing from being too hard. This same exercise is later practiced from a jumping-tower with the drop being some 30 meters. At the end of the training period practice jumps are executed from planes. After six successful jumps, two of which have been executed

French Resistance in the Haute-Savoie, the partisan successes in Yugoslavia and the Italian Resistance during the last phase of the war are convincing examples. The Swiss terrain and the surrounding frontier areas would be highly suitable for air-landing operations. In case of war, it is to be expected that the enemy will attempt to occupy certain portions of Switzerland by means of airborne troops. We have every reason for making our defense so mobile that we shall be in a position to rapidly attack and destroy airborne forces.

Identification Friend or Foe

Translated and digested by the **MILITARY REVIEW** from an article in "Transmisiones" (Mexico) October 1947.

THE device known as Identification Friend or Foe (IFF) has always been surrounded by such a veil of secrecy that up to this time it has not even been given an adequate name for peacetime use. The need for such a device was felt as soon as radar was adopted for military use. This need was due to the fact that all aircraft produced the same echo upon being struck by the radar beam. While the use of radar proved efficient for protection against approaching enemy aircraft when it was definitely known that there were none of our aircraft present in the area, it would likewise lose all of its effectiveness in those areas where both enemy and friendly planes were engaged in air combat.

During the first phases of World War II, the British had several means to identify their own aircraft, based mainly on the modification of the echoes of their radar beat frequencies. Although none of the methods devised by the British ever proved to be completely satisfactory, the experimental developments already accomplished indicated that production was possible and indispensable. It was also demonstrated by these experiments that the need for a uniform system of identification was necessary for use by all allied nations.

By agreement with the other allies, the United States took over the development of the device, based on the facts gathered by the other nations. After six months of intensive research there finally was developed an effective system of IFF which gave positive identification and is now in use in all army radar sets. IFF equipment is essentially a form of radar requiring both a ground unit with directional antenna

and a special transmitter-receiver installed in the aircraft.

Method of Operation

The following is an explanation of how IFF works: The radar set picks up the echo of an approaching plane and immediately reports its range and bearing. Based on this data, the directional antenna of the ground unit is adjusted to point directly at the indicated position.

The range circuit is adjusted next, so that the response to be picked up is limited to that of the airplane already spotted in case it is a friendly aircraft.

The ground unit of IFF sends forth a beat frequency signal which will be picked up by the receiver set of the airplane if it is a friendly craft equipped with IFF. The airplane receiver set will automatically turn on an FM transmitter upon receiving the ground beat frequency signal. This FM transmitter continues to emit its signals automatically. The signals from the aircraft are picked up by a special receiver which is part of the radar set. This signal so received is applied to the vertical plates of the cathode ray tube of the range finder, causing certain definite variations upon the echo indications produced by the airplane.

By interpretation of the code signals received upon the screen of the indicator, the operator of the ground IFF unit can immediately determine whether the aircraft being spotted is friendly or enemy.

By means of the IFF signal it has been possible to make the signal on the screen change according to whether it comes from a friendly or enemy plane.

The airplane unit is connected to the power pack upon take-off, and its operation is completely automatic from there on

without requiring the attention of the pilot.

IFF equipment was adapted to new and very important missions during the Normandy invasion. The ground sets were placed in certain definite spots by the allied secret service and the electronic beams guided the airplanes and gliders to the landing and dropping areas.

Never before during the war had the paratroopers and gliders landed with such precision, and this fact was a mystery which baffled the enemy.

IFF was one of the greatest secrets pertaining to combat equipment; such was the secrecy surrounding it that several sources of information believed that its full development had not been attained and even doubted its efficiency.

According to the experts, IFF has a definite application to peacetime avia-

tion. Any aircraft having such equipment can be located almost instantly by the airport of origin or by the airport of destination. If a pilot should fly off his route he could ask the nearest airport to determine his exact position by means of the IFF code by getting in touch with the airport through normal radio channels.

In this case, the IFF ground operator could search with his antenna until he gets the Morse signal already given to him by normal radio channels, and according to his readings on the set he could notify the pilot of his exact location.

The main advantage of IFF over radio-compass is that it operates at higher frequencies. Radio-compass is affected by weather conditions which make it subject to considerable error.

The Italian Army and the War in Russia

Translated and digested by the MILITARY REVIEW from an article by Francesco Roltini in "Rivista Aeronautica" (Italy) December 1947.

ON 30 May 1941, in Rome, the chief of the Italian government made a first gesture toward the constitution of an expeditionary corps to be sent to Russia in the eventuality of a conflict between Germany and the USSR. A few days before the beginning of the unexpected German offensive (22 June, 1941), an Italian army corps was designed as autotransportable. It was made up of the Pasubio and Torino Divisions to which had been added the 3d Rapid Division, the 21st Army Corps Artillery Groupment, the 61st Air Reconnaissance Group (twenty-two planes), the 22d Pursuit Group (fifty-five planes), ten S-81 transport planes, and the special Quartermaster Corps, East—slightly more than 50,000 men with 5,500 motor vehicles, and 4,600 animals. The armored means available consisted of one group of antiquated

armored cars which were constructed for the Ethiopian War, a mountainous theater of operations with its lack of roads, thus very light (three to five tons, according to whether they were provided with machine guns or antitank guns). These vehicles were incapable of competing with the German twenty-eight ton tanks and even less so with the Russian tanks of fifty-two tons. The antitank armament of the large units consisted of 47-mm guns, which were ineffective against the armor of the enemy tanks and, in addition, were numerically weak. In motorized means, the expeditionary corps possessed two motorized groups which, operating in the western European theater of operations which was relatively small and with no large distances to overcome, were able to provide tactical transportation for the divisions with sufficient

promptness, as well as for operation of the services. In the deep and broad Russian theater of operations, however, which was characterized by notable transportation difficulties, only the motorized transportation of a single division was possible, and even this was accompanied by great logistic difficulties.

The railway unloading zone was located near the eastern Hungarian frontier; the assembly area in Moldavia, Rumania, northwest of Jassy (central Prut) beyond the Carpathian bow, with a single connecting highway which for over 100 kilometers does not permit double traffic for heavy vehicles; the distance between the two zones was 250 to 280 kilometers and the great scarcity of motorized means presented special difficulties. Only the Pasubio Division could be motor-transported; the Torino Division was obliged to march on foot; the cavalry squadron groups and the horse artillery group proceeded in the saddle, with an echelonment in depth of more than twenty kilometers, and a resultant reduction of operative capabilities. In the operations beyond the Dniester, however, only the Pasubio Division with the 30th Artillery Groupment and the 1st Motorcycle Company were able to take part. Italian aviation had its first battle on 27 July, gaining a complete victory. The Pasubio Division had the mission of getting in back of the enemy by means of a wide swing from the north, heading afterward in the direction of Nicolaiev. The maneuver was a complete success in collaboration with German forces.

Dniester Operation

The Special Italian Corps in Russia (CSIR), after these operations, was made a part of the von Kleist armored group which had the mission of forcing a passage across the Dnieper. On 3 September, the Pasubio and the Celere Divisions were at the Dnieper. The Torino Division, which was continuing its fa-

tiguing march on foot, was still a long distance away and it was not till 15 September, after having marched 1,300 kilometers, that this division also reached the Dnieper. The forcing of the river was a double envelopment (Canne type), a maneuver dear to the Germans, and repeated with such excessive monotony as to have given the Russians time to study it and to put appropriate countermeasures into operation. Guderian's armored group in the north and von Kleist's in the south were to envelop the Kiev area and reunite behind the Russian forces shutting off every way of escape. The aviation was to operate in close collaboration with these two armored spearheads, keep them informed concerning the Russian forces, protect them from air attacks and crush eventual resistance.

Between the two groups which were leaving the Dnieper, the front was held by the Special Italian Corps in Russia and by German units, with the mission of attacking and breaking up into smaller pockets the Russian forces caught in the envelopment of the two columns. During these operations, characterized by strong and repeated Russian counterattacks supported by aviation which machine-gunned from low altitude, the Special Italian Corps in Russia successfully carried out, between 28 and 30 September, a rapid enveloping movement which was concluded at Petrikova (about 70 kilometers northwest of Yekaterinoslav).

Nearly 10,000 prisoners with a great quantity of weapons of all sorts, horses, carts, cars and trucks and other types of material were captured.

Advance to the Donetz

The advance to the Donetz followed. It should be noted that from the Nipro to the Dnieper the distance was more than 400 kilometers, with an equal distance from there to the Donetz. The commander of the Italian forces insisted,

when the German command was inclined to regard the CSIR as completely motorized and, therefore, capable of rapid, continuous and long bounds, that the automotive means at his disposal permitted the transportation of but a single division, and that even corps troops and services were only partly motor-transportable. The German command was influenced with difficulty, and reacted to only a limited extent so that the CSIR was forced to overcome great operative and logistical difficulties. Many days were spent in anxiety with regard to supplies, in which matter Italian transport aviation cooperated magnificently; indeed, the supplies often had to be limited to those that could be brought by air.

Occupation of Stalino

Stalino, center of the great mining and industrial district of the Donetz basin, was occupied on 20 October with the collaboration of the CSIR which enveloped it from the north in spite of the tenacious enemy resistance and the difficulties of the terrain which had become nearly impassable as the result of incessant rains. The CSIR continued its advance, occupying during the first part of November the entire Gerlovka Rikovo zone about 40 km. north-east of Stalino. Violent and repeated Russian counterattacks were repelled. Italian planes, although few in numbers and hindered by the weather conditions and the flying fields that had to be employed plus the scarcity of supplies of every sort, operated continuously though constantly against superior numbers.

The occupation of the above-mentioned zone was the last operation of the summer and autumn campaign of the CSIR. The following were the results: 1,400 kilometers covered, with numerous hard battles; more than 12,000 prisoners; thirty-three enemy planes brought down; large quantities of arms, materials, ammunition, horses and carts captured.

Aviation, in addition to its active part in support of the ground forces, provided a decisive contribution in the following activities: transport planes were employed to provide the most exposed troops with a minimum of woolen clothing for facing the early winter; for the transportation of food supplies, ammunition and the most urgently required materials; and for evacuation of wounded, effected in spite of the severe flying conditions, employing, in addition to transport planes, reconnaissance aircraft.

Soviet Situation

A glance at the general situation in Russia towards the end of November 1941, shows St. Petersburg (Leningrad) encircled; Moscow threatened by armored columns, which were greatly hindered, however, by continuous and violent Russian counterattacks and by the almost impassable terrain due to rains and freezing weather as well as by the obstacles created by the Soviets; Karkhov and Rostov in German hands. In the occupation of this last center, the CSIR supplied only a force of motorized troops, since the logistic difficulties did not permit the employment of the entire army corps. Italian motorized troops fought victorious battles under adverse weather conditions (over twenty degrees below zero).

The Russians, in spite of the heavy losses suffered by them and the broad and deep withdrawal effected under the German pursuit action, reacted counter-offensively. On 30 November they recaptured Rostov. The counteroffensive extended to the north and finally to the Gulf of Finland. The German army had not expected such a reaction in force. They had not provided for the manufacture of proper winter clothing, in the hope of winning the Russian war before the arrival of winter and of being able to quarter the troops with the inhabitants.

The Italians, on the contrary, as a result of the timely and importunate requests of the commander of the CSIR, promptly were issued winter clothing and many articles of clothing were given to the adjoining German forces on an exchange basis.

Soviet Counteroffensive

The Soviet counteroffensive, meanwhile, continued over the entire front, though in an intermittent fashion and with limited objectives. On Christmas day 1941, the Soviets launched an attack in force against the CSIR which was located northeast of Stalino. Perhaps the Russians counted on a lesser reaction on the part of the Italian forces, because of the fact that this was a day of especially cherished family memories among Italian people. In a furious snowstorm which impeded the intervention of aviation, Italian forces repelled the Russians and on the 26th of this same month, counterattacked together with the German units. The following day they drove the Soviets from some of the positions from which they had left for the attack. On 31 December, the 20th Bersaglieri (Rifle) Battalion reoccupied an important position which had been abandoned two days before by a German unit. Italian aviation during this action, although numerically inferior, put to flight the enemy air force which attempted to bomb and machine-gun Italian ground forces. Fifteen Soviet planes were brought down with the loss of only one Italian plane. Altogether during the last days of December 1941, 1,200 prisoners, more than thirty pieces of artillery, numerous individual arms and many motor vehicles were captured.

Meanwhile, the Russian counteroffensive continued in many other sectors of the immense front. In the Tula area south of Moscow, Guderian's armored army was surprised and almost annihilated. During the first week of the month of January

1942, the Germans fell back from the St. Petersburg lines. About the middle of the same month, the Russians launched a successful attack in the direction of Smolensk. In the second half of the same month they succeeded in piercing the front of the 17th German army and in creating southeast of Kharkov in the direction of Izyum, a broad salient, some one hundred kilometers in depth by eighty in breadth. In the following month of February, the Soviets succeeded in encircling south of St. Petersburg, in the Novgorod zone, the 16th German army which, however, stood its ground and was later freed. In March the thaw transformed the entire broad theater of operations into a marsh. Military operations in force were temporarily halted.

With the return of good weather, the German command attempted to resume the initiative. On 28 June 1942, they launched an offensive but only in the southern sector of the broad front in the general direction of the Don between Voronezh and Rostov. Having crossed the river, the offensive continued in the direction of Stalingrad and, with a wide turn to the southward, also in the direction of the oil wells of the Maicop district and in the direction of the Caucasus.

Italian "Armir"

In the meantime, the Italian 8th Army, called the "Armir," was moving toward the Don. In this army, the CSIR now became the 35th Army Corps. This army, made up of three army corps (2d, 35th, and Mountain Corps, with a total of 220,000 men in nine divisions) had been requested from Rome by Hitler in January 1942 at the time when the Soviet winter offensive was achieving notable successes. The commander of the CSIR, during a brief visit on 2 June to Rome, had a talk with Mussolini, to whom, with honest frankness, he made known his opposition to the sending of

a large body of our forces into Russia. Since the Italians were not able to provide it adequately with break-through means (armored vehicles and antitank guns) or with means of transportation (motor vehicles), to say nothing of aviation, they would be at a disadvantage. Mussolini explained that the German command had pledged to help the Italian army in every way, almost certainly by attaching a German armored division.

With its incorporation in the Armir, the CSIR underwent changes in its composition, acquired a mounted unit, army artillery elements, and the Torino Division in the place of the Sforzesca Division, which had gone over to the 2d Army Corps. The 35th Army Corps took part in the advance from the Donetz to the Don. From 17 to 20 July 1942, it fought for the possession of and captured the important coal-mining basin of Krasny Lutsch (southeast of Kharkov) with a rapid enveloping maneuver. The Germans, after this operation, sent the Italian forces toward the northeast in order to prevent them from taking a direct part in the operations directed toward the mouth of the Don, against which objective they intended to proceed alone.

Stalingrad Operation

With the advance toward Stalingrad and the simultaneous swing in the direction of the Caucasus, the Germans had their flank and rear exposed to Soviet counteroffensives. In order partially to ward them off, the German command planned to occupy the right side of the Don, particularly between Voronezh and Kalak. The Celere Division, temporarily assigned to the 17th German Army Corps, was the first of the Italian units to arrive at the Don (on 29 July) in the great bend which the river makes eastward north of Kalak. Fighting from 30 July to 13 August, to-

gether with German units and with the aid of Stukas, it threw back the Russian forces from the east side of the river. But the Russians did not desist from their attacks, attempting to cross the Don. The Armir, with its 2d and 35th Army Corps (between which was located the 19th German Army Corps), was drawn up for the defense of the Don with its right flank immediately west of the above-mentioned large bend. On 20 August 1942, the first battle in defense of the Don began. The Russians succeeded in making progress on the front of 17th German Corps drawn up on the right of the Italian 35th, which also was attacked in force and threatened on its flank and in its rear by the partial yielding of the German Forces.

Italian forces were fighting on a wide front (30 kilometers for the 35th Army Corps), but succeeded in holding the enemy who was superior, both numerically and in combat means.

On 22 August, the 35th Army Corps received as reinforcements the Celere Division, the Cervino Mountain Battalion, and the remnant (a little more than 400 men) of the German 129th Infantry Regiment. The reinforcement of the entire broad front with the few available units meant their attenuation, robbing them of their efficiency. The Italian commander decided to counterattack, choosing his directions of attack and concentrating in those places all the forces available to him. The counterattack began favorably and important positions were retaken.

The counterattack executed by the Italians forced the Russians to halt operations, but when they had received reinforcements, the Soviets resumed the offensive, continuing it until 26 September. On that day the weather conditions permitted intervention by Italian and German Air Forces which dropped large caliber bombs in the midst of Russian

concentrations, forcing the Soviets to halt their operations. During this hard fighting, the German command attempted to intervene directly in the directives of the Sforzesca Division without being well acquainted with the tactical situation. The Italian commander reacted vigorously and successfully. On this occasion, as on others, he was able to command the respect of the intruding German commands, retaining the full confidence of his subordinates and also, at heart, the esteem of the German commands themselves.

On 11 and 12 September, the Italian 2d Army Corps which, with the Cosseria and Ravenna Divisions, occupied a sixty kilometer front, was also attacked. The divisions counterattacked and pursued the enemy across the Don. In October and November of 1942, there occurred a pause in the operations on the front occupied by Italian forces. The Armir labored intensively at the task of fortifying the broad front of nearly 300 kilometers that had been assigned to it. It got back the mountain corps (Trentina, Cuneense, and Julia Divisions) in the beginning destined for the Caucasus but, because of the lack of success of the German operations in that direction, they were sent back to the Armir. The Italians ought to have had in reserve three divisions and, further back, a German armored division. But the Russian counteroffensive against the German forces which were aiming at Stalingrad and the Caucasus, had required that the reserve units be sent elsewhere, as well as the armored division, so that the Armir was disposed with all the divisions in the first line and but a few small supporting units in the divisional sectors. Moreover, there were no antitank weapons or antiaircraft weapons needed for resisting any enemy action. The commander of the Armir had objected to this situation, but was commanded from Rome to bow to all disposi-

tions made by the German command, this course having been agreed on by the two allies. The commander wrote that it was necessary for him to refuse to accept a mission which endangered the very existence of the Armir and the prestige of Italian arms. Personally, for various reasons, on 23 September 1943, he asked to be replaced in the command of the 35th Army Corps, and obtained authorization to return to Italy where he arrived on 1 November.

Second Battle of the Don

Behind the Armir, strung out in the form of a cordon (one man to each seven meters with insufficient means for combatting enemy tanks and aviation), was an immense, frozen expanse. Even the echo of the promise of help was now dead. Yet in spite of this, between November 1942 and the early part of February 1943, when the no longer placid Don became the theater of hard fighting due to Soviet attacks with powerful masses of armor and aviation, Italian forces fought successfully for several weeks. This was the second battle of the Don.

The Italian forces, surrounded by numerous and powerful armored forces and motorized units, due mainly to the yielding of adjoining large units, were obliged to fall back on foot for hundreds of kilometers across the vast frozen Russian steppe with temperatures of thirty-five to forty degrees below zero, suffering heavy losses both from Russian attacks on the ground and from the air, and the adverse weather conditions. But even under these conditions, without artillery, without motor vehicles—which had had to be abandoned due to lack of fuel—without food, they were able to repulse numerous attacks on their flanks and their rear, and to break through the Soviet troops which had passed them with their armored vehicles or motorized units.

The myth of German invincibility was shaken. The army which had made the

thrust at Stalingrad was now encircled and surrendering. In July 1943, the Germans made their last offensive effort against a Russian salient in the central sector, moving simultaneously from the north and south with all the tanks and Stukas they had been able to assemble, but their armor was halted and crushed by powerful Russian artillery employing massed fire. From this time on, the Soviet army, provided with numerous

tanks, with powerful artillery, intervening with their aviation in low-altitude flight, had nearly always the advantage. Massed columns of infantry, supported by the above-mentioned weapons, hurled themselves into the attack, renewing it when unsuccessful, without regard for losses. The German defense was tenacious, but in the end, that is, in May 1945, it was definitely broken, with the Soviet occupation of Berlin, Budapest, Vienna, etc.

The Eastern Mediterranean in British World Strategy

Digested by the MILITARY REVIEW from an article by Major E. W. Sheppard in "The Fighting Forces" (Great Britain) February 1948.

THE Government's present plans envisage the reduction of the British Army to some 500,000 men by the middle of 1948. If this reduction is not counterbalanced by a corresponding retrenchment of our military commitments, we shall incur the danger to which we have always in peace time been so prone, of failing to square our ends with our means, and of spreading our forces too widely for the safe and efficient performance of their duties. As this retrenchment of our commitments has to be made, there can be little doubt as to the area where it could most safely and easily be carried out. That area is the Eastern Mediterranean.

The Mediterranean, and the sea route through it, has, from the date of the beginning of our mercantile and sea power, been a matter of prime concern to us, since so much of our trade has always been with countries bordering on that sea and beyond it to the southward. Yet in the last two great world wars this sea passage was so much imperilled by enemy action that mercantile traffic became so costly that it had to be shut off for long periods altogether, and switched to the longer route round the Cape of Good Hope. Recent developments in the air, and in self-propelled

weapons and atomic warfare, have only increased this peril to Mediterranean traffic in time of war; and there can be little doubt that in the event of a third world conflict in which we had any great Mediterranean Power as an enemy we should once more have to switch our normal seaborne traffic to the Cape route, as we did before. On the other hand, if France and Italy are our allies, as we may reasonably expect, they should be able to keep the Mediterranean route open for our and their ships.

At the same time, our necessity for the unbroken use of this route has fortunately diminished. We no longer hold the principal responsibility for the internal and external security of two newborn Indian Dominions, which have their own defense services, though we undoubtedly still have an obligation to assist them against any attack from outside, as with any other of our Dominions or Colonies. Burma also has become independent of the Commonwealth, though here too we have a limited obligation to cooperate in her defense. Anything but a remote danger of future war in the Pacific, in which Australia and New Zealand might become involved, has now disappeared with the elimination of Japan

as a great Power, so that here too our military liabilities have notably diminished.

It must be remembered that our obligation to bring help and need to our two great Dominions in the Southwest Pacific can be fulfilled almost as quickly via the Panama Canal as by the Mediterranean, and quite as quickly as by the route round the Cape, to which we should probably be compelled to have recourse in the event of a third world war. The respective average times are: for Australia, thirty-eight days by the Mediterranean, thirty-seven days by the Cape, and forty-three days by the Panama Canal; for New Zealand, forty-two days by the Mediterranean or the Cape, and thirty days by the Panama route. Thus, in the unlikely event of a new war affecting the Pacific, the loss of the Mediterranean route would result in only a minor lengthening of our Imperial lines of supply to this far-distant theater of war, while help from Canada and the United States, with whom we might expect to be allied, could of course be brought much more rapidly. As regards the Pacific, therefore, the Mediterranean can no longer be regarded as an essential link in our chain of inter-Imperial communications, though as regards India and Burma it would always be desirable for us to be able to use it.

Eastern Mediterranean

At the same time, our direct interest in the countries bordering the Eastern Mediterranean is diminishing. We are already committed to the withdrawal of our forces from Egypt, which we undertook to carry out even before the beginning of the negotiations for a new treaty, and this withdrawal has been in progress throughout the discussions. We have now transferred the bulk of our troops either to the Canal zone or to East Africa, which seems likely to be their permanent garrison. At the same time, and

not before it was time, we have abandoned our costly and uneasy tenure of the Palestine mandate. The Palestine mandate never served any useful strategic purpose, save that of securing the oil supply from Iraq by the pipeline to Haifa, which was only necessary because of the presence of the Navy in the Eastern Mediterranean, and that of affording a promise (largely delusive so long as Palestine was in its normal disturbed state of armed rivalry between Arabs and Jews) of rapid assistance to our smaller Eastern Mediterranean allies, Greece and Turkey. The withdrawal of our forces from Palestine means only that we have abandoned a useless, if not in modern conditions perhaps dangerous, strategic commitment, which was undertaken primarily for political purposes, no longer serving any useful purpose of any kind, and was more than we could afford with our present limited military resources.

Cyprus

In this connection it might be advisable to consider the transfer of Cyprus to Greece, which has long aspired to possess it. Our tenure of this isolated outpost island is less than seventy years old and was only embarked on to facilitate assistance to Turkey in case of attack by Russia. Recently it served merely as a place of detention for illegal Jewish immigrants intercepted on their way to Palestine. Its strategic importance has vanished with the disappearance of our major interest in the Eastern Mediterranean, and so no longer justifies our maintaining a garrison there.

But, although it is no longer necessary, or possible, for us, under our revised scale of Imperial defense commitments, to maintain possession of all our former Mediterranean garrisons, it is still important for us to be able to guard the exits from that island sea so as to deny its use to any possible enemy. This we shall still be able to do, thanks

to our possession of Gibraltar at the western end and of Aden and East Africa at the eastern end; for with these securely in our hands no hostile expedition can emerge to strike our maritime routes in the South Atlantic and Indian Oceans, or to break our new chain of Imperial defense in these sea lanes. Our forces in East Africa will also be favorably placed to assist our allies in the Middle East, or to bring more rapid help to the new India Dominions in case of need, while their communications with the home country by the Cape route are far more secure than those through the Mediterranean could ever be under modern conditions of war.

550,000 Army

With the withdrawal of our forces from Egypt, Palestine, Cyprus and India, the repatriation of our occupation armies from Italy and Greece, and shortly, it is to be hoped, from Austria also, we should be well on the way to effecting the reduction of our Army to the strength of 550,000 projected by the Government, and this without the sacrifice of any strategic commitment vital to our Imperial security. We have too long been maintaining our forces in these outlying places where

they could serve no useful strategic purpose and only imperilled the security of our structure of Imperial defense through dispersion and weakness. Their retention in the existing shortage of money and manpower can no longer be justified and the sooner it is terminated the better for all concerned. The whole Middle East is now an explosive area in which we should do well to limit our commitments to what is vitally necessary for our security; and this, with the cessation of our major military liabilities in India and Burma, means little more than the safety of our sea route via the Cape, the possibility of controlling the eastern exit from the Mediterranean, and the safety of our supplies of Middle Eastern oil. All of these can more easily be insured by a strong and highly mobile force in East Africa than by our former small and isolated garrisons in Egypt, Palestine and Cyprus, which served to foster instead of to allay tension and anti-British feeling, and were rather strategic liabilities than assets in the event of a new world war. We are fortunate in this case to be able to secure so important and valuable a military economy with no sacrifice of any of our vital defense needs.

Sweden's Military Activity

Translated and digested by the MILITARY REVIEW from an article by Lieutenant Herbert Alboth in "Allgemeine Schweizerische Militärzeitung" (Switzerland) November 1947.

SWEDEN, in her national defense, finds herself confronted with problems similar to those which arise in discussions relative to army reform and general defense structure in Switzerland. Carried on under the influence of all national parties, the rebuilding of the Swedish defense system is being effected in a much less leisurely manner than is the case with Switzerland. Although true unity of concept cannot as yet be recognized in Swe-

den within individual sectors of the national defense, a transformation and an adaptation to the new conditions is taking place. A transition period with its attendant weakening effect on the army is being avoided and an effort is being made to fit the various portions of the army and service branches into a unified structure.

After careful consideration of the three alternatives of 650, 750 and 900 million

kronor for national defense worked out by the army command, the national defense committee of parliament, created last year by the Swedish government, has now made public its recommendations. The credits for Swedish national defense (for the next five years) are to be 810 million kronor.

Military training is to be given by nine months attendance at recruit school followed by a series of refresher courses. Out of consideration for the labor market, it is provided that agriculturalists called for military service will begin their training two months early. After a two months interruption for carrying on their summer labor, they will continue their recruit school course together with the other men who have been called to the colors. During the interval, their comrades will have reached the same point as they and will be able to engage in the winter maneuvers, which terminate each training period.

Supreme Command

The much debated question relative to the constitution of the supreme command was finally solved in a manner suitable to all sides. The commander in chief and the commanders of the ground, air and naval forces constitute a defense council which is to deal with the matters of chief import. Decision rests with the commander in chief, while the other members may urge revisions. The general staff, together with an operations section, is being retained in its previous form. There is a definite belief, however, that it should be more inclusive in its composition. Hence, it is anticipated that the commander in chief and two of the most important chiefs of the staff will come from different arms of the service.

These developments and problems of the Swedish national defense are fully reflected in the numerous Swedish military publications. The September issue

of "Ny Militär Tidskrift," for example, contains an illuminating introductory article, "Scandinavia Under the Path of the Projectiles' Flight," which calls attention to the fact that the dangers which lie in the future cannot be thwarted by closing one's eyes and remaining silent. The developments which began when World War II ended, have, it is alleged, changed the situation of Scandinavia in such a way that Sweden—which today lies in the shadow of two great world powers—is compelled to view matters very seriously. The possibility is shown of Anglo-Saxon air attacks on the Russian industrial centers between the Urals and Königsberg, which could be launched from bases in Iceland and Greenland. Thus, the new bases of the powers are constantly drawing nearer. The next step could be the attempt to establish bases in the Scandinavian countries. Such threats, which affect all three northern countries, can be escaped only by possession of the means of defense, which alone guarantee complete freedom of action.

Strategic Position

An article entitled "Polar Strategy and Scandinavia," is referred to by the editor as one of the most important articles to be printed in this periodical in the last twenty years. This politico-military article places the north pole in the center of the political, military and economic activity of the future. The author points to the fact that forty-seven cities of more than a million inhabitants each are on the northern half of the globe, and thirty-six of these nearer to the north pole than the equator. Also the world's greatest industrial installations lie north of the 36th degree of latitude. All this signifies that the most important areas of population with their administrative, economic and industrial centers, are situated in the northern hemisphere. And, it is alleged, these facts

must be borne more in mind in the future than has been the case in the past.

The publication, "Befäl," of the Swedish Central Association for Cadre Training, an association with which all organizations of Sweden which occupy themselves with the extra-service training of men eligible for military service are connected, gives in every issue a valuable résumé of the military problems and the lively extra-service activity of that country.

Training Aspects

According to regulations pertaining to promotion in the Swedish army, voluntary extra-service cadre training is very closely connected with the retention of a grade and promotion to a higher one. Every grade conferred on officers and noncommissioned officers of the Swedish army is, as a rule, for a period of four years. The renewal of every grade must be won by obligatory or voluntary service over a period of thirty days or by means of extra-service promotion courses. Any one who within the period of four years is not able to prove himself capable of performing the required service, drops back one grade at the end of this time. A grade that has been taken from a man can be won back only through the medium of special, promotional services. It is self-evident that as a result of these requirements, very great significance attaches to Swedish officers' and noncommissioned officers' societies. Promotion to a higher grade can be obtained by attendance at voluntary courses also. Trained noncommissioned officers, and also private soldiers are able in this manner to obtain the grade of officer candidate. Advance to the grade of captain is possible for the officer candidate in this manner.

The so-called camp-courses (*Lagerkurse*) in the training centers of the Central Association for Cadre Training en-

joy the greatest popularity. This last summer, 600 men participated in these courses in order to obtain a higher grade or retain the one already held. Many young men who are still undergoing training or who are in school sacrifice their vacation period in order, on a more voluntary basis, to fulfill their military obligations which on the basis of our system (Swiss) would cost them valuable time or render their further training quite impossible. This noteworthy and unusual method of training solves, on the one hand, many problems which are being discussed in our case but, on the other hand, gives rise to many new problems. This Swedish system certainly merits our fullest attention. At the present time, a committee is engaged in working out new rules and proposals for the so-called "long way," the voluntary system of cadre training.

Home Guard

The periodical, "Hemvärnet," official organ of the Swedish home guard, is a rich source of information relative to the activities and developments of the Swedish home guard forces. Judging from the articles found in it which constitute a valuable incentive for further training and provide information relative to present political and military situations together with discussions by competent authorities relative to Sweden's peculiar military problems, Sweden is the country that is making the greatest effort toward the development of an effective home guard, one that is deeply rooted in the national consciousness. One can gather from the reports concerning the home guard exercises, contests and other events which occur every week end in the different defense areas that training activities are particularly lively and that they cover all fields of defense—antitank defense, fighting in inhabited places, demolitions technique and the

throwing of hand grenades. Soon, every defense area will possess its own unit, which will fulfill a very particular mission in the life of the Swedish nation as a strong point of training activity and a center of *cameraderie*. The *armed industrial guard*, which had its inception at the beginning of the present year, is a new branch of the home guard in all important national and private industrial establishments. It already has its training and exercise days behind it and participated successfully in the national home guard competitions.

The combat school of the Swedish home guard at Vällinge, is becoming, to an increasing extent, a spiritual center of

this national movement. This year, different cities and sections put on a number of pretentious exhibits, in which the army, but particularly the home guard and the Central Association for Cadre Training, were represented. These exhibits were supplemented in an effective manner by weapons demonstrations, troop maneuvers and other demonstrations. It is not overstating the matter when one speaks, with regard to Sweden, of an actual military revolution, which cannot be interpreted as militarization of the people, but as active and ready cooperation on the part of the Swedish people in the interests of the military preparedness of their nation.

Speed vs. Haste

Digested by the MILITARY REVIEW from an article by Major Philip Masel (Reserve of Officers, Australia) in "The Fighting Forces" (Great Britain) August 1947.

THE farther we went in the war the more apparent it became that careful and detailed planning was an absolute prerequisite for success. The farther we went in the war the greater became the tendency on the part of some tactical instructors to overemphasize the importance of speed in mounting an attack. "Battle drills" became a cult: a philosophy that logical thought was no longer required. What seems to have been intended as a laudable scheme for doing something instead of nothing developed into a precept that fire and movement could be ordered as freely and instinctively as a right wheel on the drill square.

Few tacticians will dispute the fact that "fire and movement" is the basic principle of the attack—whether it be the attack by a rifle section helping itself forward with its light machine guns, or the attack by a brigade group moving forward with the help of artillery and close air support, or the attack by armor providing its own self-contained and simul-

taneous application of fire and movement. But not one of these various types of attack can be set in motion by pressing the button marked "Battle Drill." Even the humble section leader must first ask himself a few questions:

"What is my object—to press forward, or to probe, or to procure information, or to protect the axis of advance? If I am to push forward, which approach do I choose? When will I need fire support? From where can it best be provided?"

The emphasis placed in training on "speed at all costs" becomes the more difficult to understand when one recalls that in most campaigns the half-baked encounter attack was seldom profitable and that the most successful deliberate attacks were those preceded by intensive planning and preparation. This lesson was learned both in the desert (where, for example, the Eighth Army spent three months getting ready for the Battle of El Alamein) and the jungle (where, for

example, the 9th Australian Division spent weeks in full-scale rehearsals for its amphibious operations in New Guinea and Borneo).

And yet while the 9th Division was actually engaged on those very rehearsals there was a school of thought in the Australian Army—and it probably had its representatives in the British Army—which vehemently argued that the tempo of modern warfare was too quick for old-fashioned ideas about battle procedure, rehearsals, and the correct launching of troops into battle. At least one Australian formation trained on the principle that a battalion commander would never be given more than forty-five minutes in which to mount a full-scale attack. *In actual fact there were few instances in the war fought by the Australian Forces of commanding officers being given less than forty-five hours!* The result of this emphasis on speed was that some units did not know how to use time when it was freely available.

Tactics and Logic

In the early stages of the war much of our trouble was due to the fact that junior commanders hesitated and lost time because they were insufficiently trained in the general principles of tactics and in the art of logical thought. "Battle drills," mistaking effect for cause, aggravated the trouble by implying: "Don't worry, old chap! Here are half a dozen diagrams which are better than all your general principles and logical thinking. With those diagrams and plenty of guts you cannot fail."

By all means let us train the junior commander to think quickly and to issue his orders clearly and concisely, but we must not encourage him to think that initiative, judgment and tactical knowledge can be reduced to a few diagrams. By all means let us train him to take

short cuts in emergency, but let us also show him the main and long-established route to success in battle.

Battle drills are the hasty, lazy way of teaching tactics. Speed in tactical planning and action can be obtained only from the commander who has toiled at his practice and scales.

The average corporal will have a better chance of striking the right note in battle if he has been trained to understand general principles. It need scarcely be added that "battle drills" must not be confused with "battle procedure," which is a normal and well-established method of shortening the period of reconnaissance and preparation.

Tempo of Operations

A further consideration is that a series of operations by two or more force commanders will often require objectives to be gained by a stipulated day or hour. Where for security reasons junior commanders cannot be given the exact target time for success, they could perhaps be given instructions as to the tempo of operations as a guide in considering the "time and space" factor. "Fast tempo" would mean that reconnaissance and preparation are to be reduced to a safe minimum; "normal tempo" would mean that the local commander is entitled to use his own judgment in properly launching his troops into battle.

In this matter the comments of Field Service Regulations are a little misleading. Referring to the time factor, Volume II says: "On the one hand, an attack launched without adequate reconnaissance and preparation is unlikely to succeed; on the other hand, when a favorable position for the attack has been gained, delay and hesitation are fatal. . . ."

The terms "on the one hand" and "on the other hand" are open to criticism: they suggest a conflict between adequate preparation and delay and hesitation. The

passage might well be rewritten to read as follows:

"An attack launched without adequate reconnaissance and preparation is unlikely to succeed, but the degree of adequacy must be determined by the tactical situation. Care must be taken that, when a favorable position for the attack has been gained, the emphasis on reconnaissance and preparation does not lead to delay and hesitation that may enable the enemy either to strengthen his defenses and complete his arrangements to meet

the attack or to avoid the blow by withdrawal."

It is pretty true to say that the present emphasis on speed is derived from a desire to inculcate the offensive spirit. But the offensive spirit is based on morale and confidence, and few things are better for the morale and confidence of troops than the knowledge that they are about to be committed to a thoroughly planned engagement. So, in the final analysis over-emphasis on speed destroys the things which it tries to create.

Soviet Aviation in the Battle of Berlin

Translated and digested by the MILITARY REVIEW from a Soviet article by Colonel Loutchkine in "Forces Aériennes Françaises" (France) February 1948.

IN the battle of Berlin, which ended with the total defeat of the armed forces of Germany, Soviet military aviation took an active part in the fighting in conjunction with Soviet infantry, artillery, and tanks.

The German high command was well aware of the decisive importance of the battle that was taking shape, and consequently had concentrated an army of 500,000 men in the Berlin sector, with much armor and artillery. German aviation in this sector included more than 2,000 planes, 60 per cent of which were fighters. The German defenses of Berlin were composed of three continuous lines of fortifications, in addition to a large number of intermediate works well supplied with permanent structures and anti-tank and antipersonnel obstacles. Even the city itself was powerfully fortified and organized for long and stubborn resistance.

The Soviet high command had concentrated powerful forces for this operation, finally obtaining supremacy over the enemy in infantry, artillery, armor and aviation. The following declaration of Marshal Zhukov of the USSR, made at a

press conference in Berlin shortly after the end of the war, gives an idea of the scale of this offensive:

"We hurled into the attack more than 4,000 tanks supported by 22,000 guns and mortars. As regards the air, our attack was supported by 4,000 to 5,000 planes which had gone into action the preceding night."

Superiority of this sort permitted the Soviet army not only to penetrate the German defense system, which was echeloned in great depth, but also guaranteed the success of the operations far back of the first lines, where the final battle for possession of the enemy capital was to take place.

Peculiarities of the Operation

The attacks of the ground forces were made simultaneously in several directions. This was part of the plan for breaking up the German front with the objective of encircling and destroying the principal German army group operating before Berlin and in the city itself. The conduct of this offensive operation by the Soviet troops was rendered complicated by the fact that the terrain between the

Oder and Berlin was powerfully fortified and included a large number of wooded areas, streams and inhabited places, well organized for defense.

The Germans understood that the battle of Berlin would decide the fate not only of their capital, but of their entire nation. Their stubbornness on the ground and in the air was therefore greater. This situation undoubtedly had its influence on Soviet aviation. The following are the special characteristics of the employment of Soviet air forces during the course of this operation:

1. Numerical superiority in aircraft was on the side of the Soviet army, which insured initiative in the air and the possibility of effectively protecting Soviet ground forces against German air action;

2. Soviet air forces were employed in mass on narrow sectors of the front, their efforts being concentrated in the directions in which the principal masses of ground forces were operating, such employment permitting more rapid reduction of the German defense;

3. The efforts of all categories of aviation were at all times directed toward assisting the ground forces in breaking the first line of defense and toward protecting the offensive elements against attacks from the air;

4. The intensified activity of German aviation and the great density of German anti-aircraft defense in the defense zone, demanded vigorous and skillful action by personnel of the Soviet air forces.

Battle for Air Supremacy

At the beginning of the operation, the air situation was characterized by efforts on the part of the Germans to make use of the main portion of their aviation for resisting the First White Russian Army Group operating in the principal sector.

From the beginning of the offensive at Küstrin, large German air units of forty

or more planes per group attempted to attack the Soviet infantry with bombs and machine guns. During the first day, they made more than one thousand sorties against the First White Russian Army Group. In other sectors, the number of sorties was considerably less.

Pursuit aviation of the First White Russian and the First Ukrainian Army Groups, whose objective was to prevent all German air force activity over the battle field, took off at dawn of the first day to protect the Soviet troops who had passed over to the offensive. This protection was insured by large fighter formations immediately above the Soviet ground attack elements. Moreover, preventive attacks had also been planned for the Soviet bombers against the German airdromes.

Special fighter groups had been created by the Soviet air forces for use in certain sectors in which there was special need for protecting the ground forces against all air attacks.

The Soviet fighter patrols generally went to meet the Germans far from the field of battle proper. As a result, the German formations heading for the Soviet attack elements did not, as a rule, reach their objective. Even in those cases where isolated units did succeed in getting into the Soviet area, they were obliged to drop their bombs haphazardly.

40 Per Cent German Loss

The battle for air supremacy was particularly lively at the beginning of the operation, when the Germans attempted to halt the attack of the Soviet ground forces by means of massed air attacks. The number of air battles waged by Soviet fighters during this phase of the operation gives an idea of this effort. From 16 to 22 April, the fighters on the First White Russian and the First Ukrainian fronts engaged in 841 battles, bringing down 813 enemy planes, or a total of 40 per cent of the planes protecting Berlin.

This figure proves that the Germans suffered a decisive defeat in the air in the first five days of the offensive resulting in a considerable slackening of German air activity.

Nevertheless, in spite of these losses, the Germans did not abandon the employment of air forces against the Soviet ground force attack. The Germans only changed their tactics. Groups of fighters and attack planes, abandoning medium altitudes, began using low-flying tactics in the hope of avoiding Soviet fighter aircraft. They attacked their objectives, as a rule, by hedge-hopping, after having feigned a detour.

To meet these tactics the Soviet air forces increased their fighter patrols, echeloning them at different altitudes, beginning at 500 meters. The air battles which resulted ended in complete victory for the Soviet fighters. On 22 April 1945, over the entire sectors of the First White Russian and the First Ukrainian Army Groups, there were only thirty air battles. The advance of the ground forces had caused the Germans to evacuate many of their first-line airdromes. The total number of air sorties during this battle for air supremacy over Berlin rose to over 30,000, and the losses inflicted on the Germans were extremely heavy.

The Breakthrough

In contrast to other offensives of the Soviet army, the ground force attack against Berlin was preceded by a short air preparation, with a simultaneous artillery preparation. The plan of the high command was to provide direct aid with bombers and attack planes, to the ground forces attacking the Germans' main line of defense. This employment of aviation aims at crushing the main line of defense in order to facilitate the advance of the ground forces, especially during the first day of the operation. In carrying out this plan, hundreds of bombers struck a series of blows at dawn against

enemy objectives situated back of the line to be attacked by the First White Russian troops. A large number of bombs were dropped on enemy batteries and fortifications. The attack was very effective, especially as regards the German heavy artillery. After this first attack, the attack planes were employed. They attacked the machine-gun nests which had not been spotted before or which had not been hit by the artillery fire. The first wave of attack planes, totalling more than a hundred, attacked objectives which were only a few hundred meters (300 to 500) ahead of the attacking Soviet ground forces. These attack planes forced the defenders to the ground, diminishing the intensity of their fire and permitted the Soviet ground forces to advance at less cost. A series of German strong points were taken without trouble. The attack planes carried out their attacks in successive waves. The Soviet troops advanced under the protection of this cover of planes and occupied one position after the other, mopping up only those centers of resistance which remained intact. On the right flank of the First Ukrainian troops, when everything was ready for crossing the Neisse, the attack planes laid down a smoke screen on the west bank, greatly facilitating the infantry crossing.

This type of operation by attack aviation may be designated as direct air support of an infantry attack. The operation was dictated by the depth of the German defenses, which could be pierced only by means of the constant cooperation of all arms, including aviation.

The use of many field radio transmitters insured the accurate designation of targets to be attacked at the desired time. The transmitters were moved forward with the ground combat elements. They were used to direct the attack plane groups to the places where the infantry was meeting the greatest opposition.

As a result, the infantry, preceded by

attack planes and supported by powerful artillery and tanks, succeeded in pushing salients of from eight to ten kilometers into the German positions the first day.

At the same time, Soviet bombers continued to attack objectives further to the rear, preventing the Germans from committing fresh reserves. This activity of the Soviet bombers prevented the Germans from unleashing counterattacks which they were ready to make in various sectors of the front.

Air protection over the battlefield was provided by detachments of fighter aircraft which accompanied the attack planes and bombers. In addition, the fighters at times blockaded the advanced air-dromes of the German fighters. These attack and bombing operations in the direction of Berlin continued from 16 to 22 April, until the moment when Soviet ground forces succeeded in effecting a complete breakthrough of the German main line of defense.

The role of the air force during the breakthrough was to accompany, for a relatively long period, the Soviet infantry, which was advancing over a strongly fortified area in which the defenses were echeloned in depth. In this way, aviation completed the action of the artillery, particularly where artillery fire might be ineffective. This tactical use of air forces to accompany the infantry without question greatly accelerated the infantry advance.

Ground-Air Liaison

It has been seen that the principal function of aviation in this operation was to provide direct support for the ground forces. Consequently, the entire mass of planes was placed at the disposition of the air force command at the front, thus permitting rapid concentration at places required by the general situation. When the advance of ground

elements was not too great, liaison with the air forces was simple.

The air force command of the First White Russian Army Group designated in advance the attack plane and bomber groups which were to accompany the various ground elements. The coordination of operations was therefore fixed before the beginning of the operation. All that remained was to clarify certain points as to details. This was facilitated by locating the command posts of the attack and fighter groups in the command posts of the armored formations. The latter's columns, moreover, were regularly accompanied by attack planes, which neutralized the German's guns when they revealed their positions by firing on the first Soviet tanks.

The situation was more complicated on the First Ukrainian front. Here aviation had to accompany armored elements which had pushed rapidly ahead, losing contact with their infantry. In this case, Soviet aircraft received instructions directly from the mobile elements. Certain assault groups of Soviet aviation had to support the advance of particular tank formations throughout these detached operations.

The rapid advance of the First Ukrainian army group created the problem of shifting the Soviet air bases. At times, Soviet services occupied former German air-dromes before their approaches were definitely cleared. However, just as was the case on the right flank of the First White Russian army group, fighter aviation protected the advance of Soviet troops on a broad front. Large groups of fighters were constantly operating over the ground elements.

Encircled Elements and City Attacks

Soviet ground forces, having effected breakthroughs in different directions, encircled several large groups of German forces which attempted to break out and join the main body. On 24 April, the Ninth German Army was entirely sur-

rounded southeast of Berlin. With a large number of men and much matériel intact, this army attempted to break through toward the west, where the Twelfth German Army was coming to its rescue. In order to annihilate the encircled force the Soviet army directed at least 70 per cent of the air forces of the First Ukrainian front against it. The air attacks were made against the extensive concentrations of German troops in mass formations of from sixty to 100 bombers or attack planes at a time. These sorties were regulated by the aviation command posts and lasted for twenty-four consecutive hours.

Finally, in close collaboration with artillery and infantry, the Soviet forces succeeded in depriving the Germans of all freedom of maneuver on 29 April. This fighting, in which aviation played a large role alongside the ground forces, continued for five days and ended on 1 May with the defeat of the Ninth German Army.

As regards the city of Berlin, its attack by Soviet aviation was at first only incidental; most of the aircraft were used in support of infantry and armored ele-

ments engaged against the German defenses.

Later, when Soviet troops advanced as far as the suburbs of Berlin and its outlying areas, Soviet bombers and attack planes were sent against the city itself. They operated in mass, the bombers under the protection of powerful fighter detachments, it being assumed that the Germans had concentrated there all their air defense means. As for the attack planes, they followed the same action in the suburbs of Berlin as in the breakthrough of the front.

On 25 April the bombers of the First White Russian Army Group dealt two blows on the concentrations of German troops in the center of Berlin. During each of these sorties from 500 to 1,000 planes took part. These attacks greatly disorganized the German defense, destroying not only communications but also a large number of fortified points. The territory occupied by the Germans in Berlin diminished day by day and all Soviet air activity against the city was finally suspended to avoid interference with the operations of the Soviet infantry.

The Army Transportation Service

Digested by the MILITARY REVIEW from an article by Brigadier R. F. O'D. Gage in "The Royal Engineers Journal" (Great Britain) December 1947.

In Army parlance Transportation covers docks, railways and inland waterways; it does not cover air transport, road transport, nor transport in sea-going ships.

The Army possesses a Transportation Service consisting of specially trained personnel to take all executive action in connection with its transportation needs; these personnel are provided from the Royal Engineers and are formed into specialist units and establishments designated as RE (Tn.).

In peacetime the Army has little use

for a Transportation Service since its requirements can normally be covered quite adequately by existing civilian undertakings. Major movements have of course to be arranged and planned by the staff and the railway company, shipping agent or other party concerned, notified in advance. Then the necessary transportation is provided in exchange for a railway ticket, warrant or other form of agreement. Even when civilian resources are inadequate it is extremely difficult to supplement them with military resources, except as

a long-term measure and at the risk of causing civil unrest and precipitating strikes. In these circumstances, coupled with financial stringency and manpower shortage, it is scarcely surprising that the Transportation Service of the Regular Army in peace is a small concern, though it has been almost agreed that some 15,000 skilled men shall be included in our auxiliary forces in the postwar period. By placing reliance on civilian agencies the Army is accepting a risk of failure in peace, for such agencies not infrequently cease to function at times of industrial dispute or civil unrest. On the other hand there is considerable advantage in having a large reserve in our auxiliary forces for it is from civilian life that we must obtain the skilled and experienced technicians. In the Regular Army in peacetime the average soldier is so young and training facilities are so restricted that it is not possible to produce really experienced transportation men in considerable numbers. For example, the average age at which a man is permitted to take charge of a train on a civilian main line is about thirty-five; most soldiers have left the Army long before they attain that age.

Transportation in War

In time of war, however, the transportation situation is liable to be very different. Civilian agencies are likely to be completely impotent for long periods in captured enemy countries or liberated territories, apart from the fact that they almost certainly will have suffered severe damage and dislocation due to the impact of war. Even in those regions not actually in the war zone military traffic is often so much greater in volume and of such a different nature from peacetime that it is far beyond the capacity of civilian agencies to handle it unaided. In these circumstances the Army must possess, in war, a Military

Transportation Service of a size commensurate with its commitments, if the conduct of operations is not to be prejudiced. In the late war by VJ-day the Transportation Service (including Indian and Dominion troops) reached a total of 146,000 men—about one-third of the size of the whole Corps of Royal Engineers—including 4,000 officers of whom only thirty-four were regulars. This figure is somewhat startling—representing as it does, the equivalent of nine divisions of fighting troops; but it was not excessive and in fact paid a handsome dividend in terms of tonnage moved in support of operations.

To state that military strategy is dependent upon transportation is almost a platitude. One of the main objectives of any commander-in-chief is to cut the communications of, and deny the use of bases to, his opponent; and conversely to secure and develop adequate communications for his own armies. Throughout the late war the plans for the launching and subsequent maintenance of every campaign were conditioned to a large extent by the capacity of the transportation facilities that existed, or could be developed. Indeed, it is inconceivable that any commander would embark on an operation without considering transportation and its influence on the military situation.

As an illustration of the scale of transportation commitments in war, the operations of the Twenty-first Army Group in Northwest Europe afford a good example. In this campaign the Transportation Service, assisted by unskilled labor and civilians when available, discharged 5,487,600 tons of military cargo, opened, reorganized and operated 1,020 miles of railway with an average daily lift of 18,000 tons reaching a maximum of 40,000 tons, and controlled or operated a fleet of 6,000 craft on the inland waterways. To move 40,000 tons daily

by road an average distance of one hundred miles and return empty would have needed about 30,000 three-ton trucks and 30,000 drivers plus a large maintenance and repair organization. This was a bill which would have been far beyond the resources of the Twenty-first Army Group.

How is the Transportation Service organized to perform its role in war? In a theater of operations, Transportation is one of the "Q" Services, headed by a director, who, in common with other directors, is responsible to the principal administrative officer for the efficient working of his service. As the head of one of the RE services he is also responsible to the E-in-C. (or Chief Engineer) in the latter's capacity as coordinator of all engineer activity in the theater. His responsibilities in this connection are related principally to the efficient and economical use of engineer resources in men and material, to keeping E-in-C. advised of Transportation progress and estimated future requirements, and to administrative matters affecting the Corps of Royal Engineers.

The branch of the staff with which the Transportation Service is most intimately concerned is the "Q" Movements branch, which is responsible for coordination on behalf of the principal administrative officer. It is of the utmost importance that these two shall work together in the closest harmony at all levels and in fact attempts were made in one or two theaters during the war to combine them into one organization called "Mov. and Tn." It has been decided that this organization will not be perpetuated since there is a need for Q(M) staff and Tn. service just as much as for Q(Maint) staff and S. & T. Service. The Transportation Service is responsible for providing the means of movement, but it is the Q(M) staff which decides what shall be moved and it is obvious that these two must be closely

coordinated if the best use is to be made of available capacity.

A Transportation Directorate will usually be divided into three main branches—Railways, Ports and Inland Water Transport—each headed by a deputy, or even a director, with a number of sub-branches for dealing with the various forms of activity in detail. The control of Transportation activities is usually more centralized than in the case of other Services for the reason that Transportation is largely concerned with through traffic which takes little account of local military boundaries. The basic reason, of course, is that railways and waterways are long and thin whereas military areas are round or square. This state of affairs does sometimes give rise to difficulty when local commanders feel that they should have some say in the conduct of Transportation activity within their own territories; but the fact is that where through traffic is concerned it is impossible to decentralize control to any great extent without loss in efficiency.

Methods of Operations

The method by which the Transportation Service executes its allotted tasks is similar to that adopted by other services. Specially trained units with the requisite equipment and stores, are deployed where they are wanted, according to the known or anticipated incidence of Transportation commitments. The first of these commitments is "Docks." In recent years the word Docks has been replaced by "Ports" as more clearly descriptive of the commitment. The Transportation Service may be required to work on beaches or in open roadsteads and moreover is responsible for all technical matters connected with the general operation and maintenance of ports, so the word Docks does not fully represent its activities.

In port working, the Transportation Service is responsible for:

(1) Discharging motor transport, stores, and equipment from ships to craft or quay, and for loading from quay to road or rail transport.

(2) Maintaining equipment, cargo handling gear, cranes, etc., required for use in the port.

As a result of long experience the capacity of port operating units is known and for purposes of calculation may be taken as 800 tons or up to 570 vehicles per squadron per day. Failure to achieve this figure is nearly always attributable either to rough weather or to lack of clearance facilities rather than to inability to get that amount of cargo out of the holds. Like any other activity, ship working should be properly planned with the object of discharging the ship in the shortest possible time with economical use of resources. For example, the typical cargo ship has one hold very much larger than any of her other holds; in such a case the proper plan for discharge is to concentrate maximum sustained effort on the big hold and to phase work on the other holds in such a way that they are all empty by the time the big hold is empty. This point is mentioned because Transportation has often been criticized for failing to get to work promptly on all the holds of a ship as soon as it arrives. Anyone who feels qualified to criticize ship discharge should withhold his criticism until he has ascertained what is the plan for work and the reasons for it.

Port Working

There is a catch phrase that "The ship always beats the shore." Generally speaking this is true, though, like all rules, there are exceptions to it. More often than not the limiting factor in port working is clearance by road and rail and ability of depots and dumps to receive, rather than ship discharge. In many cases it is sound practice to discharge for sixteen hours a day and to clear for twenty-four, but it is quite useless

to clear for twenty-four hours a day unless depots are geared to keep open and to accept stores throughout the twenty-four hours. This is a matter that calls for coordination by the staff and by local area commanders.

The planning of the repair and development of ports is a responsibility of the Transportation Service though the actual execution of the work is done by engineer resources allotted by the Chief Engineer. It is worthy of note that there is no case on record in recent years of a captured port which was unable to receive and discharge some ships by the time seaward access had been cleared of mines and other obstructions, though the complete repair of the port to full capacity often took a long time when demolitions were extensive.

The division of responsibilities for repair of ports as between the Royal Navy and the Army is set out in a War Office and Admiralty Pamphlet entitled "Principles for the Operation and Control of Captured or Liberated Ports." Briefly, the Army is responsible for work above low water mark and the Navy for work below it. This means that the Navy is responsible for providing seaward access and for removing wrecks or other underwater obstructions to navigation, and the Army plan must therefore be closely related to naval potentialities. It is obvious, for example, that the Army must not embark on the repair of a quay until it is clear that the Navy will be able to provide seaward access to it. In practice, many obstructions are partly above and partly below water mark and a decision as to responsibility for clearance has to be taken by mutual agreement in the light of local conditions. Generally speaking any clearance involving removal by flotation is undertaken by the Admiralty Salvage Department but removal by other means is arranged jointly by the Navy and the Army.

While the capacity of a port depends

primarily upon its physical characteristics, such as the number of berths where ships can discharge alongside or at anchor, the working efficiency as a whole is dependent on good management, sound organization, and an intimate knowledge of local conditions.

However good and careful the planning may be a perfect organization can only emerge from experience, and it is quite safe to assume that the capacity of a captured port will rise by about 50 per cent during the first month of occupation, as result of experience, and apart from any physical repairs or developments that may have been undertaken.

The second Transportation commitment is "Inland Water Transport." This includes lighterage in ports, and even when there are no canals or navigable rivers it may be a large commitment. The capacity of a port, particularly in the early stages, can often be greatly augmented by the use of lighters, thus enabling ships to be discharged at anchor as well as, or instead of, at alongside berths. The number of serviceable lighters in a captured port is usually quite inadequate and it is therefore necessary for Transportation to import tugs and lighters as well as IWT crews to man them. The IWT organization includes workshops for maintenance of craft and these must be set up early, for craft soon go out of action unless properly and regularly maintained.

The extent of the Transportation commitment on inland waterways depends upon geography, but it may be taken that where water transport forms an important part of the local transport system the Transportation commitment will be a large one. For example, in Burma and the low countries IWT was a large undertaking; in Algeria and Southern Italy it was small.

The third and possibly largest commitment is "Railways." Despite the vast expansion of road and air transport, rail-

ways still stand unrivalled in their capacity to convey heavy loads over long distances at high speed. It is interesting to note that administrative plans for nearly every assault operation during the late war assumed no railway service for about ninety days. And yet in every case some sort of railway was working by D+14; and long before D+90 the whole administrative build-up upon which the ability to prosecute operations depended was conditioned largely by railway capacity.

Captured Railways

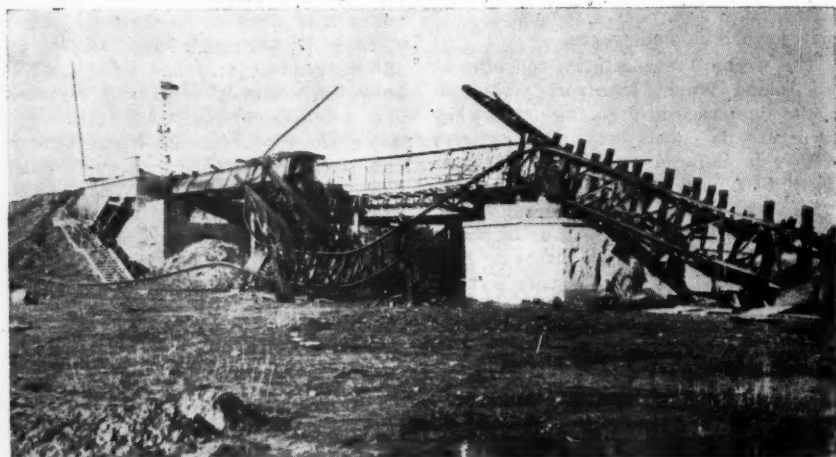
The first thing to do with a captured railway is to repair and reopen the various routes, yards and sidings. Given an adequate supply of railway engineers and mechanical equipment this is a straightforward task and it can be done in a much shorter time than was thought possible a few years ago. The limiting factor is nearly always the repair of major bridges or tunnels, but the development of Unit Construction Railway Bridging has enabled bridges to be repaired at a speed which would have been thought fantastic even in 1939. For instance, the Rhine crossing involved a new bridge half a mile long over running water twenty feet deep. This bridge was built and opened in one month from the date on which the site was captured. Demolished tunnels probably provide the greatest headache, especially when they are through sand or wet ground, and few competent engineers would have the temerity to give an estimate of the time required for repairs in such circumstances. It is, however, one thing physically to repair a railway but quite another to organize and operate it to give a regular and reliable railway service. A modern railway is a highly technical and complex organization, and even under favorable conditions it is a slow and painful business to reorganize its operation once it has been thrown out of gear. This task is one of the main preoccupations

of the railway troops in war and it is just as important as the more spectacular task of repairing bomb damage or demolished bridges. It usually takes the form of complete military operation, followed by a process of gradually handing back responsibility to the civilian authority as soon as the latter can be reorganized and put to work.

The feature of a railway which is of most interest to the Army as a whole is its capacity. Broadly speaking the capacity of a railway is measured by the product of

per day. One way to increase this limit is, of course, to reduce the length of the sections by constructing new crossing stations and signal cabins.

The size of the trains is limited by the ability of available locomotives to haul and brake them up and down the maximum gradients, or in some cases by the length of the loops at passing stations. These can be increased either by importing more powerful locomotives within the limits imposed by the strength of bridges and rails and sharpness of curves; or by extending the



Bridge over the Albert Canal at Herenthals. View of damage after German withdrawal.

the number of trains that can be run over it and the size of these trains. The number of trains is, in the first instance, limited by the length of the longest block section. For example, on a single line with a block section taking forty minutes to traverse, it is theoretically possible to run one train each way every eighty minutes—or eighteen trains a day maximum. In practice it is seldom possible to operate more than about 60 per cent of the theoretical maximum, so in this case the practical limit is about eleven trains each way

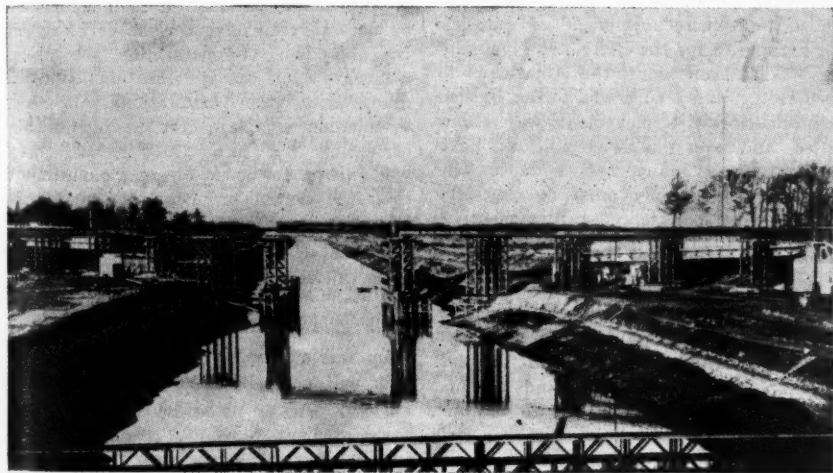
length of passing loops if the latter is the limiting factor. There are a number of other factors, any one of which may be limiting, of which the following are commonly encountered—number of available locomotives; running shed and maintenance facilities; number of train crews; stocks of coal and water supply; terminal facilities for loading and unloading; and railroad car supply. The way to increase the limit imposed by any of these factors is self evident, except in the case of car supply for that is a rather more compli-

cated matter which to a considerable extent lies outside the control of the Transportation Service.

It must be remembered that a rail car, like a motor truck, is performing no useful work except when it is moving under load. The main object of anyone using a railway should, therefore, be to keep the cars moving and thus improve the "turn-around." It is obvious that the average number of cars that can be placed for loading per day is the total number of cars di-

pool of empties than would otherwise be necessary) and by estimating his requirements correctly. Most people in the army realize the importance of quick loading and unloading, but not all realize that to demand cars and fail to use them is a worse crime than to load slowly, for in the former case cars are doing nothing useful for a day at least; in the latter they are held up for a few hours only.

In war there is nearly always a railroad car shortage. More often than not the



Bridge over the Albert Canal at Herenthals. View after reconstruction.

vided by the average turn-around, and therefore any reduction in turn-around will increase the number of cars available for loading. The time of turn-around is influenced by two groups of people—the railway operators and the railway users. The railwayman can improve turn-around by speeding up trains, by reducing time spent in sorting and marshalling yards and by holding the minimum pool of empty cars. The user can improve turn-around by loading and unloading cars quickly, by keeping his demands as regular as possible (for irregular demands involve a larger

solution lies in improving the turn-around rather than in importing more cars and possibly adding to the congestion on a system which already possesses as many cars as it can conveniently absorb. The organization of a proper system of car control is one of the principal preoccupations of the railways branch of a Transportation Directorate and it is a subject of fascinating interest. The situation in Belgium soon after its liberation in 1944 affords a good example. At that time there was the usual car shortage and it was therefore decided to apportion the available cars among the

three principal users—British Army, American Army and civil traffic; each being responsible for using its own cars to the best advantage for its own purposes. But an analysis of traffic revealed that the Americans were moving loads from Antwerp to South Belgium and sending empties back; civil traffic was moving from South Belgium to France and returning empty; and British traffic was moving up from France to Antwerp and returning empty. In fact there was a clockwise movement of loading cars and an anti-clockwise movement of empties. By arranging for the British to give empties to the Americans, the Americans to civil traffic, and civil traffic to the British the anti-clockwise movement was eliminated and everyone was able to have nearly twice as many cars as before. The moral is—car supply must be centrally controlled by experienced railwaymen.

Coal and Water

It may be as well to mention coal and water. A main line locomotive will use something like five tons of coal per day. On a well developed rail system the coal consumption amounts to thousands of tons per day, and when this has to be imported it may well conflict with the import of other military stores. There were many occasions during the late war when the capacity of railways was in danger of being restricted by a shortage of coal.

It is perhaps not generally realized that steam locomotives are very large consumers of water. The figure is about one hundred gallons per mile, or 10,000 gallons per engine per day. A railway using 1,000 engines would need at least 10,000,000 gallons a day delivered at convenient points along the system and so stored that any locomotive can fill up in not more than five minutes. This may produce a very large engineering commitment and there have been many occasions when lack of water has imposed

a limit on railway capacity. The Western Desert Railway is a good example and it was not until a pipe line had been constructed and some diesel engines were substituted for steam that water supply ceased to impose a limit on the capacity of that line.

The quality, as well as the quantity, of water is of importance. Water for regular use by locomotives must be clean and free from substances liable to damage the boilers. When a new source of supply is to be used it will generally be necessary to have the water analyzed by an expert to determine the steps necessary for its purification and in many cases the installation will have to include a plant for sedimentation, softening and purification which may well prove to be a larger commitment than the actual provision of the requisite quantity of water.

The Staff usually requires two things of a railway—first that it shall be open for traffic quickly and second that it shall give reliable service.

In war, speed in construction or repair will normally take precedence over economy in use of resources. It must, however, be realized that time saved in actual engineering work may not represent a net saving if the difficulties of operation are unduly increased. Short and long-term considerations must be fairly balanced and it requires a nice judgment to decide whether it is better to produce a bad railway quickly, or a good railway that will give maximum service with minimum trouble less quickly. The Transportation man will always recommend the good railway, but it is necessary that technical officers realize their responsibilities to the Army in this respect and do not allow technical considerations to outweigh military considerations to such an extent that the prosecution of operations is prejudiced.

The tonnage of military stores used by the Transportation Service is not large compared with the tonnages required by other Services, but unfortunately much of it is awkward to handle and there are many heavy lifts. Such items as locomotives, tugboats and large cranes require special shipping arrangements and special arrangements for unloading. During the war, however, great progress was made in shipping this sort of equipment in sections which could be readily reassembled in the theater. This greatly eased the shipping problem but it did of course involve delay in getting the machines to work and threw a heavy load on the workshops responsible for re-erection in the theater, often working under difficulties and with inadequate facilities.

The Director of Transportation remains responsible for forecasting and scaling store requirements. In fact this is one of his principal preoccupations, for without adequate stores and equipment the Transportation Service can achieve little.

In war, it is essential that the forecast of Transportation stores required for a military operation is made at the earliest possible stage in the planning. It is not sufficient to plan months ahead for such items as locomotives and tugboats that will probably be required in the early stages of the campaign. Sufficient time must be allowed for the ordering and construction of such equipment, and yet more time for their shipment by sections and for their reassembly in the theater.

Finance

Another matter that is liable to be of great importance to Transportation is Finance. In war the usual view is that money does not matter. That theory, however, does not apply to Transportation for the reason that Transportation policy is invariably directed towards the

earliest possible resumption of control by civilian agencies, with the object of releasing military manpower for future commitments. A civilian agency will not, and indeed cannot, work for the Army or anyone else unless it is paid. It must have cash to pay the wages and salaries of its employees and to make its day-to-day purchases. On the longer term view it must have funds for maintenance, renewals, purchase of stores for stock and possibly even for such things as pensions and interest on capital investments. The simplest way of dealing with all this is to pay for services rendered at agreed rates (e.g., so much a ton) but it is the hardest thing in the world to settle a rate that will satisfy the civilian management and at the same time guard the interest of the British taxpayer. Negotiations on such matters often last for months or years and give much occupation to financial pundits. From the point of view of the Director of Transportation, however, it is essential that the civilian agency shall be paid enough, first to insure that the undertaking can carry on at all, and second, to offer a financial inducement that will be sufficiently attractive to make the agency work in an efficient manner. All this may occupy much of the time of a transportation director on active service and his HQ will certainly include some expert accountants to handle the detailed negotiations. Who pays what, when an American troop train is hauled by a British engine with a French civilian driver?

The Transportation Service in peace is a comparatively small concern and in consequence there is a tendency to belittle or even to neglect it. The danger of this is that there may also be a tendency to belittle it in war, and that is a most serious matter; for any commander or administrative staff officer who neglects his Transportation Service will

very soon find himself in trouble. For every military operation there must be a proper transportation plan and history affords plenty of examples where the lack of such a plan has had serious repercussions on military operations. Like any other Service, Transportation needs guidance and coordination by the staff, but it also needs support and considera-

tion. In all administrative planning due weight must be given to the recommendations of the Director of Transportation. There will often be occasions when it is necessary to overrule his recommendations and in all such cases it is his duty to insure that the consequences are properly represented to, and appreciated by, the Staff.

The German Invasion Plan

Digested by the MILITARY REVIEW from an article by Lieutenant P. G. Lachlan, Royal Navy, in the "Journal of the Royal United Service Institution" (Great Britain) November 1947.

Two days after Mr. Churchill's declaration that Britain would never capitulate, Hitler intimated in a conference with his Naval Commander in Chief that he still thought England would fall without being invaded. He believed that blockade from the sea and attack from the air were all that would be necessary. At this conference Admiral Raeder gave Hitler a report on certain investigations that his staff had made regarding a possible invasion of England. He stated that it would be necessary to start vigorous air attacks on British bases in order to destroy ships under construction and repair. He went on to discuss a place for the landing, the question of mines, invasion craft, shipping available and ended by pointing out that air supremacy was an absolute necessity. But it was not till the end of June that Raeder's suggestion was taken up by the Supreme Command, who, on 2 July, issued the first directive for Operation "Sea Lion."

In this directive, Hitler ordered an invasion of England to be planned. He called for reports from his Service chiefs on the possible strength of the British defense, details of shipping available, and a survey of suitable landing points. He pointed out that landings should be planned to cover a broad front to facili-

tate subsequent deep penetration, and he asked his Air Force Command for an appreciation on the chances of attaining air supremacy.

Invasion Directive

At a conference on 11 July 1940, Admiral Raeder, keenly aware of British sea power, stated that an invasion should be used only as a last resort to force Britain to sue for peace. With this Hitler agreed; but in the next few days he changed his mind. On 16 July, he issued his directive for the invasion of England.

This stipulated that the landing operation was to be a surprise crossing on a broad front extending approximately from Ramsgate to a point west of the Isle of Wight. He asked each of the fighting Services for their views on preliminary operations, such as the occupation of the Isle of Wight or Cornwall. He then laid down certain preparations which were to be undertaken:

(a) The British Air Force must be eliminated to such an extent that it would be incapable of putting up any substantial opposition to the invading troops.

(b) The sea routes must be cleared of mines.

(c) Both flanks of the Straits of Dover and the western approaches to the

Channel, approximately on a line from Alderney to Portland, must be so heavily mined as to be completely inaccessible.

(d) Heavy coastal guns must dominate and protect the entire coastal front area.

(e) It was desirable that the English fleets, both in the North Sea and in the Mediterranean, should be pinned down (by the Italians in the latter instance), shortly before the crossing takes place. With this aim in view, the naval forces at present in British harbors and coastal waters, should be attacked from the air and by torpedoes.

These and other preparations Hitler ordered to be completed by the middle of August.

In reply to this directive Raeder sent to the Supreme Command a long memorandum explaining the difficulties from the naval point of view.

(a) The transport of troops would have to take place from a coast whose harbor installations and adjacent inland waterways had been extensively damaged through the fighting in the campaign against France or were of limited capacity.

(b) The difficulties of wind and sea in the Channel.

(c) The amount of work required to make ships suitable for beaching.

(d) The difficulties of mine sweeping.

(e) The necessity for air supremacy for the protection of the invasion fleet while it was assembling.

(f) The strength of the Royal Navy.

On 21 July Hitler stated that in view of the prevailing weather in the Channel, the main operation would have to be carried out by 15 September.

During the next few days the Army sent theoretical demands to the Naval Staff which allowed for 100,000 men being landed in the first wave in the area between Ramsgate and Lyme Bay. The amount of shipping required to carry this load was estimated as 1,722 barges,

471 tugs, 1,161 motor boats, and 155 transports.

On 29 August there is an entry in the War Diary which read:

"(a) The Army requires the transport of thirteen landing divisions (about 260,000 men). In view of their anticipated tasks, the Army High Command regards this as the minimum number, from which no departure can be permitted, even if there are difficulties in transport.

— (b) These thirteen divisions must attack the English coast on the widest front (from Ramsgate to Lyme Bay); which means that they must leave the French coast as far as possible simultaneously on the widest front . . .

(c) The Army General Staff requires the landing to take place at dawn."

Army-Navy Disputes

These demands by the Army began a series of acrimonious disputes with the Navy on the question of landing on a broad or narrow front. From the point of view of the Navy, security could only be guaranteed if the landing were limited to a narrow front in the Straits of Dover.

At a conference on 31 July, at the Berghof, Raeder made a fairly detailed report to the *Fuehrer*. He explained that all preparations were in full swing but that 15 September would now have to be considered as the earliest possible date. The mine sweeping, he reported, would take three weeks, given good weather and air superiority; mine laying would begin at the end of August and would take two weeks.

He then went on to discuss the date and time of the landings. For this he gave three requirements:

(1) The best time for the beginning of the landing would be about two hours after high tide. The fact that this entailed craft being beached and immobile for some twelve hours was preferable to landing on a rising tide. In the latter case there would be serious delays in

disembarkation because craft would keep on floating off.

(2) The Army was required to land at dawn, which would mean crossing the Channel in the dark.

(3) To take such an unwieldy fleet across the Channel in total darkness would be exceedingly difficult. Therefore, for navigational reasons, half-moonlight would be necessary.

Taking into account these factors, there were two suitable periods, from 20 to 26 August and from 19 to 26 September. The August period was out of the question as preparations would not be complete.

Broad vs. Narrow Front

Raeder next gave his reasons for opposing the principle of landing on a broad front. He argued that convoys from Le Havre and Cherbourg, for the western landings, would be sailing, virtually unescorted, into the immediate vicinity of the main naval bases of Portsmouth and Plymouth. He therefore gave his opinion that the landings should be concentrated in the Straits of Dover, where the shorter route could be more easily protected. The Air Force, said Raeder, would also not be able to protect the landing effectively over such a broad front.

Hitler then decided that an attempt should be made to prepare the operation for 15 September. The final decision as to whether the operation would take place then or in May 1941, would be given after the Air Force had made concentrated attacks on southern England for one week. However, in a directive from the Supreme Command, issued on the following day, preparations for a landing on a broad front were ordered to be continued in spite of the Navy's warning.

For the next fortnight the "broad" versus "narrow" controversy raged strongly. There was little appreciation by the Army Command of the transport difficulties involved and they persistently re-

fused to give way to the naval demands. The result was a deadlock between the two Services and, on 13 August, Hitler was asked to decide. A compromise was eventually reached, and in a directive dated 16 August, Hitler ordered the preparations for a landing in Lyme Bay to be discontinued. On 27 August, final decisions were made. Landings were to take place in four main areas: Folkestone-Dungeness; Dungeness-Cliff's end; Bexhill-Beachy Head; Brighton-Selsey Hill. The first operational objective of the Army was to be a line from Southampton to the mouth of the Thames.

Deceptive measures were also planned, the principal being a feint landing on the northeast coast. This latter operation involved four transports escorted by four cruisers which, two days before "Sea Lion," were to proceed south from Norway to the area between Aberdeen and Newcastle, and then to retreat at dusk back to the Kattegat. Other diversions were to be made towards Iceland, while the armored ship *Admiral Scheer* was to make a commerce raiding sortie into the Atlantic.

On 1 September, the movement of shipping from German North Sea ports to embarkation ports began. The *Luftwaffe* had announced at the end of August that the air situation was favorable in spite of the effect of bad weather on their operations. They estimated RAF losses since 8 August as 1,115 aircraft against their own losses of 467 aircraft. Control of the air therefore seemed likely and, on 3 September, a directive from the Fuehrer's Headquarters gave 20 September as a tentative date for "D" day.

However, within a few days the High Command had begun to have misgivings about the whole operation. German Intelligence reports calculated the size of the British Army in England as 320,000 trained troops, 100,000 reserves, 900,000

recruits, 320,000 others (Home Guard, etc.) Total 1,640,000.

Unconfirmed reports put the number of divisions in England at thirty-nine, of which about twenty were regarded as completely operational, but whose artillery was believed to be only at half strength. These reports worried the High Command, and in addition, the preparation of barges was behind schedule. Nevertheless, it was decided to continue with the operation, but there was no longer the same anticipation of easy victory.

It was at about this time that Hitler began to show interest in the possibility of attacking Russia, and he ordered twelve divisions to be moved into Poland. He was still prepared to invade England, if necessary, but he was beginning to doubt whether "Sea Lion" was worth the risk.

On 6 September the war against England was reviewed. Raeder reported that the Navy was progressing with the flank mine barrages but that, due to bad weather and lack of air support, the sweeping was behindhand. He pointed out to the Army that the crossing would be difficult and that they could not count on keeping the divisions together. He gave his opinion that "Sea Lion" appeared possible given favorable circumstances regarding air supremacy, weather, etc.

The discussion then turned to what would be done if "Sea Lion" was not carried out. Hitler agreed that the appearance of an invasion should be kept up at any rate. The possibility of operations in the Mediterranean was stressed and in particular that Gibraltar should be seized before the United States came into the war. It was further agreed to concentrate on the disruption of British merchant shipping by increased submarine warfare and by air attacks on the ports. These latter operations should be

continued ruthlessly, irrespective of whatever other operations might be undertaken.

On 10 September, the Naval Staff reported that, though the weather had been bad, they would be ready on 21 September. They considered that air attacks ought now to be shifted from London to Portsmouth and Dover. However, they were not prepared to demand this since they knew that Hitler hoped his attacks on the capital alone might be decisive.

On 13 September the RAF sank eighty barges at Ostend; ships of the Royal Navy bombarded Calais, Boulogne, Ostend and Cherbourg, while light coastal forces attacked minesweepers and barges. On the same day capital ships of the Home Fleet moved south to Rosyth in readiness to dash at full speed to the invasion area.

Postponement

On the next day, Hitler called his commanders together. Before the meeting began, Raeder presented a short memorandum. It pointed out that the air situation did not provide the necessary conditions for carrying out the operation, as the risk would be too great. He further stressed the importance of intensifying the bombing on London in the hope that these attacks might have a decisive outcome. At the conference which followed Hitler agreed that the degree of air supremacy necessary to justify executing operation "Sea Lion" had not yet been reached. He said that on 17 September he would decide whether the operation would take place on 27 September or not.

On 17 September, an entry in the War Diary stated:

"The enemy Air Force is still by no means defeated; on the contrary it shows increasing activity. The weather situation as a whole does not permit us to expect a period of calm . . . The *Fuehrer* therefore decides to postpone 'Sea Lion' indefinitely."

Two days later a directive was issued

to disperse the invasion armada but to keep it at ten days notice.

The situation was summed up in the War Diary:

"(a) The preparations for a landing on the Channel coast are extensively known to the enemy, who is taking more countermeasures. Symptoms are, for example, operational use of his aircraft for attacks and reconnaissance over the German operational harbors; frequent appearance of destroyers off the south coast of England, in the Straits of Dover, and on the Franco-Belgian coast; stationing of his patrol vessels off the North coast of France; Churchill's last speech, etc.

"(b) The main units of the Home Fleet are being held in readiness to repel the landing, though the majority of the units are still in western bases.

"(c) Already a larger number of destroyers (over thirty) has been located by air reconnaissance in the southern and southeastern harbors.

"(d) All available information indicates that the enemy's naval forces are solely occupied with this theater of operations."

Troops and ships were kept in readiness until 12 October, when the Operation was postponed until the spring of 1941. In a directive from the *Fuehrer's* Headquarters, he ordered the army formations allocated for "Sea Lion" to disperse. The British, he said, must continue to believe that preparations for an attack on a broad front were being made. At the same time the German war economy must be relieved of some of the heavy strain placed upon it by the invasion preparations. By the spring of 1941, however, Hitler and his staff were deeply involved in the preparations for invading Russia, and operation "Sea Lion" was finally shelved.

Conclusions

The Reports on the Naval Conferences only give one aspect of the planning,

but they suffice to give a very good indication of the whole situation. Admiral Raeder was "dismayed" to discover at one stage that the Army thought the operation comparatively simple.

Then there was the *Luftwaffe*. They were set the task of defeating the RAF, but in this they failed. The German Air Force knew, even if their figures were more fantastic than ours, that they were shooting down a lot of British aircraft. In their reports the words "superiority" and "supremacy" seem to have been used synonymously when referring to the air situation. The High Command seem to have required air "supremacy," which was unnecessary. They treated the whole affair as very much of a kid-glove party, but that is not war. They should have been prepared to accept losses commensurate with the size of the prize they were after. They could have maintained an adequate measure of superiority in the air, over a limited front, to have invaded successfully.

When Hitler decided on war, what was his plan for England's future? Her eventual subjugation must have been part of his over-all strategy, but still he was content to ignore sea power. Yet it was sea power that finally upset his plans for invasion. It does not matter whether it was the RAF or the Royal Navy which was the particular instrument that decided him. He was frightened of attempting a Channel crossing. He failed, as a leader, to give his staff the singleness of purpose and the impetus which are always necessary when embarking on a hazardous operation. That the German Navy could have carried their Army across the Channel, in spite of our opposition, seems certain. But where the High Command should have pressed forward with all their resources and energies to overcome the obstacles in their path, they tackled the task like a bevy of school girls frightened of getting their party-frocks soiled.

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